The Defense Implications of Arms Control

Summary of the Sixth Annual International Conference on Controlling Arms

Christopher M. Parent & Richard S. Soll, Editors

Defense Special Weapons Agency
United States Department of Defense

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PREFACE

The Defense Implications of Arms Control is a report on the substantive presentations and discussions of the Defense Special Weapons Agency's Sixth Annual International Conference on Controlling Arms. The conference is organized each year to provide a multinational forum for the topics that comprise the policies, technologies, and operations of arms control, including treaty arrangements, cooperative threat reduction, and proliferation prevention and response. The 1997 meeting was held at the Waterside Marriott Hotel and Conference Center in Norfolk, Virginia, from 2 to 5 June.

This report is a summary of the conference sessions, based on rapporteurs' notes and, in some cases, written material provided by presenters. The speech by the Honorable John D. Holum, Director of the U.S. Arms Control and Disarmament Agency (ACDA), is presented verbatim as furnished by ACDA's Public Affairs office. The speeches by the Honorable Harold P. Smith, Jr., and Ambassador Robert L. Gallucci, as presented herein, are summaries based on transcriptions.

The views presented are those of the conference participants and do not represent the views of the Defense Special Weapons Agency, the Department of Defense, Science Applications International Corporation (SAIC), or the Center for Verification Research (CVR).

Christopher M. Parent and Richard S. Soll of SAIC/CVR edited this report. The rapporteurs were William Haas, Jessica Kaplan, Dru Lutinski, Daniel R. Miller, Robert J. Mitchell, Christopher M. Parent, Anne K. Shukis, Christina M. Ratchner, and David R. Wilton. The editors thank Jeffery M. Heftman, James T. Bushong, Michael R. Miggins, Verne V. Wattawa, and Deborah B. Lincoln for their editorial and substantive support.

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OVERVIEW

THE DEFENSE IMPLICATIONS OF ARMS CONTROL

Arms control is located at the intersection of several currents in national and international security affairs: It is a product of diplomacy; a by-product of international and domestic political relationships; a means toward economic ends; a consumer of new and existing technologies; and a reflection of national leaders' mind sets, as well as an instigator of new views and beliefs. Most importantly, arms control has a major role with regard to a nation's defense establishment, including the military services, in the policy, operational, and technical dimensions. As John Holum, Director of the U.S. Arms Control and Disarmament Agency, aptly noted in his keynote address to this conference, the old way of thinking held that arms control and national defense are opposites, while, in fact, the basic purposes of arms control and defense are precisely the same: to enhance our safety and security.

The sixth annual Defense Special Weapons Agency (DSWA) International Conference on Controlling Arms took place almost exactly one year after the fifth conference, which also had been held in Norfolk. The intervening year witnessed a number of impressive achievements in arms control, including these:

- Using assistance from the Cooperative Threat Reduction program, Ukraine became a non-nuclear-weapons state in June 1996. Belarus followed suit in November.

- The Chemical Weapons Convention entered into force on 29 April 1997. (The United States had ratified the treaty in April, thus allowing its representatives to be part of the convention's governing body. The first meeting of member states was in May.)

- Last winter, states parties to the Biological Weapons Convention met at the 4th Review Conference of the Convention, where they agreed to hold a series of ad hoc committee meetings aimed at developing a legally binding verification regime.

- The United States and Russia signed the Comprehensive Test Ban Treaty in September 1996. The other three declared nuclear-weapons states have also signed the treaty.

- The Treaty on Conventional Armed Forces in Europe (CFE) adaptation talks began on 28 January of this year. On May 14, the United States ratified the CFE Flank Agreement.

- In January 1997, President Clinton decided to pursue a ban on the production, storage, transfer, and use of antipersonnel landmines through the Conference on Disarmament in Geneva.

- With respect to the pending Open Skies Treaty, the Final Operating Capability aircraft has completed all necessary tests and has been cleared for the Open Skies mission.

- At the Helsinki Summit meeting in March 1997, Presidents Clinton and Yeltsin agreed
  -- to begin negotiating a START III treaty which would cut the number of

long-range warheads on each side to no more than 2,000 to 2,500 by the end of 2007;

-- to preserve the Anti-Ballistic Missile Treaty and allow the United States to proceed with all theater missile defenses under development;

-- to strengthen the Organization for Security and Cooperation in Europe, as well other European security arrangements; and

-- to pursue bilateral efforts to enhance openness regarding potential U.S. and Russian chemical weapons capabilities, as well as cooperation in the destruction of chemical weapons.

- The Russian-NATO accord of May 14 allows NATO to expand its membership, but stipulates that a new NATO-Russian council be formed to discuss security issues. In return, NATO pledged not to deploy nuclear weapons or nuclear storage sites on the territory of new members.

- The Nunn-Lugar-Domenici legislation expands ongoing threat reduction and nonproliferation programs to the Department of Defense to encompass the domestic requirements for preventing and protecting against the threat of terrorism with weapons of mass destruction.

In addition to--and in many cases contributing to--these accomplishments was the creation, in June 1996, of the Defense Special Weapons Agency, transformed from the Defense Nuclear Agency. This organizational change reflected the Agency's expanded mission pursuant to emerging conditions and requirements in the post-Cold War international security environment. A large part of this new mission is further reflected in DSWA's becoming a combat support agency, serving the core military roles and functions of the Department of Defense and, in particular, the commanders-in-chief of the unified combatant commands.

The theme of this conference--*The Defense Implications of Arms Control*--was an outgrowth of DSWA's expanded (and expanding) role and its transition to a combat support agency. Because of DSWA's unique position and accompanying unique perspective at the juncture of military operations, arms control technology RDT&E (research, development, test, and evaluation), and Cooperative Threat Reduction implementation, the Agency convenes the community each year for this series of speeches, presentations, and discussions. It is quite fitting that the first speakers at the 1997 conference after DSWA's Director, Major General Gary L. Curtin, delivered his welcoming remarks, were John Holum--representing the arms control community--and General Eugene E. Habiger, USAF, Commander-in-Chief of the U.S. Strategic Command--reflecting the military perspective. Although each approached the theme from a different direction, the congruence of their ideas and their goals, in terms of enhancing national security and global stability, was striking.

The thrust of the remarks by General Habiger and the members of the panel he chaired, entitled *Warfighters' Perspectives on Arms Control,* was that arms control, assuming that it is planned and administered wisely, can be quite beneficial to the warfighter in today's security environment by helping to define or limit the weapons at the disposal of a given state. The uncertain threats and unknown enemies in today's world make this especially important to the warfighter, who must also have a strong voice at the negotiating table, primarily in interpreting the implications of a given regime for military requirements and national security in general.

The second plenary session explored the potential benefits, pitfalls, and

political-military impact of implementing recent proposals for reducing the world's nuclear weapons arsenals to much lower levels than those at present. The panelists generally concurred that a number of issues remain to be resolved before deep cuts can be undertaken, including the changed nature of deterrence and targeting, the range of responses to the use of any weapon of mass destruction by a nation or substate group, and the role of national and theater missile defenses. Technical and verification issues were left for the members of Panel 5 to discuss the following morning.

The closing plenary session followed a format instituted in 1996 for the final conference session: a freewheeling roundtable discussion featuring leading individuals from both civilian and military segments of the national security arena. This year, the topic of the closing discussion focused on whether arms control is and would likely remain what former Secretary of Defense Perry termed "defense by other means"; in other words, can arms control have an impact on national security comparable to and complementary with the traditional military resources available to the defense establishment? The consensus among the roundtable members was that in this contemporary--and projected future--world of uncertainty, arms control can be a valuable tool for the national security policy maker and implementor. It was also argued, however, that measures aimed at enhancing transparency and increasing intrusiveness--major trends in arms control--might be misguided and, thus, economically and politically costly.

The remaining panels examined more specific issue areas under the overall theme of the defense implications of arms control, dealing with on-site inspections, particularly as applied to enforcement of peacekeeping objectives in the Balkans (Panel 1); ballistic missile defense (Panel 2); international cooperative technology efforts (Panel 3) and regional technology applications (Panel 4) for verification; technical issues related to nuclear weapons elimination, as noted above (Panel 5); and chemical and biological weapons elimination issues (Panel 6).

Complementing the plenary and panel sessions were several featured speeches, in addition to the introductory remarks by DSWA's Director. The first, mentioned above, was the keynote address delivered by John Holum, which is included verbatim in this report. Commenting on the juxtaposition of arms control and defense, he observed that while defense deters or defeats threats, arms control, which takes weapons out of a potential enemy's hands, can avert these threats more subtly. Mr. Holum also contended that the argument often used against arms control--that it will "lull us to sleep" and cause us to neglect our defenses--is erroneous and, in essence, is anti-security. After reviewing the current and prospective arms control agenda, he concluded that "now more than ever before, arms control must be a central element in the kind of unified national security strategy that befits a great power in a perilous world."

In a speech on the second full day of the conference, Dr. Harold P. Smith, Jr., the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs, spoke about some of the impediments to implementing arms control objectives erected by non-governmental and governmental organizations and the press. He gave a detailed accounting of the problems encountered by the Department of Defense in attempting to destroy--safely, economically, and effectively--the U.S. chemical weapons stockpile by means of a proven incineration technology. Unfortunately, the bureaucratic delays increase the risk from the aging chemical weapons, because the longer the weapons remain untouched, the greater the chance they will leak their lethal

agents into the environment. Dr. Smith's speech is a lesson in what can go wrong politically in an arms control case in which technological and financial hurdles have all been averted.

Ambassador Robert L. Gallucci, currently Dean of the Georgetown University School of Foreign Service, delivered the featured after-dinner speech, addressing the threats facing us in today's world and possible arms control solutions. According to the Ambassador, the status of nuclear weapons proliferation will remain uncertain for some time, owing to the availability of fissile material from Russia, the direction of China's foreign policy, and the capabilities and possible incentives by such nations as South Korea and Taiwan to acquire nuclear weapons. While diplomacy, including arms control, remains a vital security instrument, it will work only if other instruments such as sanctions and the potential use of force remain credible options. In maintaining arms control regimes the overriding security objective should never be sacrificed or placed ahead of the regime, even if this puts the regime's existence at risk.

The seventh conference in the series will be held in Philadelphia, Pennsylvania, from 8 through 11 June 1998. The DSWA annual conference has become an important forum for both formal and informal discussions in the arms control, nonproliferation, and threat reduction arenas, and the organizers are committed to maintaining the acknowledged excellence of the presentations and the diversity of affiliations and views.

KEYNOTE ADDRESS BY
THE HONORABLE JOHN D. HOLUM
Director, U.S. Arms Control
and Disarmament Agency

I am pleased to keynote this important conference, centered on the relationship between defense and arms control. It is a topic of deep interest to me, and one that may well decide whether we succeed or fail in addressing many of the likeliest security challenges ahead.

The old way of thinking has it that arms control and defense are opposites--that arms control takes away or limits commanders' options. It is surely possible to caricature arms control along those lines--especially playing off those who treat arms control as an end in itself, a noble, selfless, moral thing to do. But none of that fairly describes arms control's true purpose and role. And I insist that in the changing security environment, arms controllers and defense planners both must do better at seeing their work as a collaboration.

In fact, the fundamental purposes of arms control and defense are exactly the same: to make us safer. Defense deters or defeats threats; arms control can avert them more quietly. It seeks first of all to limit the adversary's options, to take weapons out of hostile hands.

Of course, arms control generally is not a matter of simply waiting for the other side to give up weapons you would rather it didn't have. It is negotiation. So we have to accept limits on our own forces as well. That doesn't change the call, but only makes it closer. Considering all costs and benefits, each proposed agreement must net us more security; otherwise don't do it.

Incidentally, I would exclude from that calculus the stock argument of those who don't like arms control--exercised most recently in the debate over the Chemical Weapons Convention--that arms control will "lull us to sleep," and cause us to neglect our defenses. I do not believe we should go to sleep now that the CWC is in force. But I also suggest that the "lull us to sleep" argument is anti-security. It would expose the American people and American forces to avoidable dangers--just so we'll have an incentive to heighten our guard. The world is too dangerous to indulge such folly.

But by rational measures, we've seen that the arms control and nonproliferation agreements in force today clearly do increase our net safety. Quite often, as in the CWC and the Biological Weapons Convention, they ban weapons we don't want for ourselves anyway. In other cases, as in START and the NPT, they protect our basic defense requirements, while answering serious security concerns.

Russia's SS-18 missiles, for example, are the most devastating arms ever pointed our way. A weapon system designed to defeat them would, *optimistically*, cost many billions of dollars, and could do so only in the midst of a nuclear war, after our nuclear arsenal would have failed its prime, deterrent mission--and when any glitch would be catastrophic. But under the START treaties, every last one of those missiles is on its way to extinction-- certainly, verifiably, and without a shot being fired.

Also consider that aggressor and rogue states see weapons of mass destruction as equalizers --perhaps even nullifiers-- of conventional military power. In the Gulf War, for example, Iraq's military was decimated by the superior conventional forces of the United States and our coalition partners. But had Saddam Hussein been successful in acquiring--or using--nuclear weapons, our planning and execution scenarios would have been dramatically different. For us, unquestionably the world's preeminent conventional military power, the lesson is that our security is enhanced whenever we can keep weapons of mass destruction out of the picture.

So we should treat arms control as a hard-headed national security mission--one aptly described as "preventive defense."

Against that backdrop, let me note the role of arms control in dealing with some of the most prominent existing and emerging international dangers.

Despite the Cold War's end, Russia remains the one country that could inflict overwhelming nuclear devastation on the United States. We have a great deal of unfinished business there.

Indeed, we have only begun to reap the START treaties' benefits by actually removing thousands of weapons systems. Ukraine, Kazakstan and Belarus are now nonnuclear, but we still have some five years of hard work ahead on implementing START I--verifying that missiles are sliced apart and silos are filled in, and negotiating over Treaty interpretation and compliance.

And before START *II* can complete a two-thirds reduction in arsenals, and eliminate the last of those SS-18 missiles, it still has to be ratified in Russia--where, as you know, there is considerable resistance. A number of Duma members have complained that START II will require Russia to eliminate multiple warhead missiles, and then build new single warhead missiles in order to maintain parity with us.

They need to focus on Russia's realistic options. *Without* START II, the United States is legally obliged by Congress to maintain START I force levels of 6,000 accountable weapons, which actually translates into some 8,500 warheads, given the counting rules. Russia could match that only at ruinous expense. But *with* START II, Russia will have actual parity at 3,000 to 3,500 warheads.

And in Helsinki, Presidents Clinton and Yeltsin agreed that START II is not a wall, but a door--not the end of strategic disarmament, but the opening to its next step, down to a range of 2,000 to 2,500 warheads. As soon as Russia ratifies START II, our negotiators will begin work on those further cuts, which can obviate any perceived need for Russia to add anything at all to its nuclear forces.

Another obstacle to Russian START II ratification concerns the status of the ABM Treaty, which strictly limits national missile defenses. In this realm, as in most others, there is an obvious connection between offense and defense. As the number of offensive missiles comes down, the perceived ability to deter attack can be weakened if the other side can neutralize a retaliatory strike through missile defenses. Accordingly, the ABM Treaty's health does influence the prospects for further strategic arms cuts--and, indeed, even for continued implementation of START I.

Here again, the Helsinki summit was productive--in two ways. First, the two nations again affirmed their commitment to the ABM Treaty. Second, and even more importantly in my view, they moved in a practical way to protect the Treaty, by confirming that it does not interfere with our plans to produce highly capable theater de-

fenses--a topic to which I'll return. If the Standing Consultative Commission can translate that political understanding into practical agreement--which has proved elusive in the past--this step can and should clear away another obstacle to START II.

Meanwhile these U.S.-Russia issues are being overshadowed by a danger no less ominous: proliferation of weapons of mass destruction and missiles to rogue regimes and terrorist groups around the world.

- More than 40 countries now have the technical and material ability to develop nuclear weapons, should they decide to do so.

- More than 15 nations have at least short-range ballistic missiles--and many of those are pursuing weapons of mass destruction.

- Some twenty countries--many hostile to us-- have chemical weapons programs; another fifteen have the capability and motivation. And chemical weapons have been used, most recently in war by Iraq and by terrorists in Tokyo's subway.

- The case of Iraq reminds us that biological weapons are also attractive to outlaw governments and groups.

- And recalling the World Trade Center and Oklahoma City bombings, we must ponder how even more awful the suffering would have been if even primitive nuclear, chemical or biological weapons had fallen into the wrong hands.

Cold War constraints are gone. Technology is widely available. Even as we work to counter these dangers militarily, we must work to contain them through arms control.

Our main tool against the spread of nuclear weapons, of course, is the Nuclear Non-Proliferation Treaty. Without it, for example, I believe North Korea would have nuclear weapons by now--perhaps even enough to sell. The NPT was the basis for possible international sanctions against North Korea's unexplained nuclear program--and now for continued on-site verification that, as agreed, it remains frozen.

In 1995, we succeeded in making the NPT permanent. It is also becoming more nearly universal--with 185 member states and only five remaining outside.

We are strengthening its safeguards. On May 15 the IAEA Board approved an enhanced safeguards initiative adding new technologies and access, such as environmental monitoring away from declared facilities, to help make sure that nuclear weapons programs are not being concealed from inspectors. The next step is for each member country--including the United States--to implement new safeguard agreements.

The Comprehensive Test Ban Treaty, even before its entry into force, is already a substantial added barrier to the spread or enhancement of nuclear arsenals. The United States has conducted well over 1,000 nuclear tests--hundreds more than any other country. So we gain security to the extent we lock all nations in place on the nuclear weapons learning curve. For any tiny increment in knowledge we might gain from more tests is dwarfed by the value of preventing tests by others--including rogue states who could derive quantum leaps of capability from even a few explosions.

As a further barrier, President Clinton has directed that we intensify our efforts this year to negotiate a cut-off in the production of fissile material for weapons. The fissile cutoff is both our best hope of capping the nuclear weapons potential of

countries outside the NPT, and an arms control measure to formally limit the nuclear weapon states.

Unfortunately, the cutoff is stalled in the Geneva Conference on Disarmament, or CD, by efforts to link it to negotiations there on all nuclear arms and a timebound framework for their elimination. As I told the CD plenary session May 15, such ill-founded linkage not only fails to advance nuclear disarmament but can set it back, and in the process drive the CD to the periphery of international affairs. How ironic it would be if the 23 new members were to find they struggled to get into the CD, to miss out on its glory and only share in its decline.

Meanwhile we also need to deal with fissile material already in being. Dismantlement of U.S. and Russian nuclear weapons obviously is a good thing, but with a dangerous side effect--the release of tons of the special nuclear materials from which others could make a bomb. Many experts have identified this so-called "loose nukes" problem as a leading danger of our time. I think they are right. It is important that in Helsinki Presidents Clinton and Yeltsin agreed that START III would include measures relating to both the transparency of strategic nuclear warhead inventories and the irreversible warhead destruction.

U.S. ratification of the Chemical Weapons Convention this spring opens the way to the real heavy lifting in arms control, in implementation, including verification and a weighty load of new work for the On Site Inspection Agency. It also lets us turn more negotiating resources to the threat of biological arms. The 1972 Biological Weapons Convention is virtually toothless in terms of ensuring compliance. So we are now negotiating in Geneva to exploit advances in technology and in arms control techniques, to make this treaty, too, into an effective instrument.

In this context, because it is an area of great interest to me, and I know you have a panel dealing with verification technologies, I want to mention the growing contributions of science to arms control. To cite just one example, I recall only a year ago talking about a portable gas chromatography-mass spectrometry (GC-MS) instrument that weighed just 70 pounds, and would be a great resource for monitoring the CWC. Today that same instrument comes in a miniaturized hand-held version.

I'm very proud of ACDA's work, along with DoD and DOE, as co-chair of the Non-Proliferation and Arms Control Technology Working Group, which now coordinates some $2.6 billion in R&D that is relevant to arms control and nonproliferation.

The spread of ballistic missiles that could carry weapons of mass destruction is another growing security danger. I see these missiles in three broad categories, all bearing on the 1972 ABM Treaty.

- The first are Russia's ICBMs and SLBMs, now in being. As to them, as political conditions evolve, stress continued deterrence and further reductions--both of which depend on the ABM Treaty.

- The second category is made up of missiles we might confront in theater, also now in being and improving. As to them, we are negotiating to clarify the line of demarcation between strategic defenses, which the ABM treaty covers, and theater defenses, which it does not--and have agreed on principles confirming that all six U.S. theater missile defense programs can proceed.

- The third category consists of limited numbers of ICBMs threatened by rogue states. Those are not now

in being, and our intelligence says they won't be for at least a dozen years. If they do evolve, future arms controllers may well be called upon to negotiate amendments to the ABM Treaty to permit limited national defenses. In the meantime, we need the ABM Treaty. Prematurely junking it would help perpetuate weapons that could threaten us right now.

In short, I hope we can manage, as a nation, to drain some of the emotion and theology from the debate over missile defense, and develop a common assessment of what our security requires--and when.

If you consider the potential of arms to inflict damage, you are obviously drawn to weapons of mass destruction, which can wipe out whole cities at a time. But if you consider their actual impact, you are drawn to conventional weapons, which routinely are wiping out whole cities, a few people at a time.

One way to attack this issue is to address specific weapons that have extraordinary effects on civilians--such as antipersonnel landmines, which are scattered across the globe and kill or maim some 25,000 non-combatants annually, mostly children playing or farmers returning to their fields, long after a war is over. Last year the United States led a successful international negotiation to control mines that cannot be detected or will not self-destruct. Now President Clinton has urged a bolder step-- negotiation of a global ban on antipersonnel landmines. This will be a leading priority of the second Clinton term.

This has necessarily been a broad overview. I have barely touched, for example, on the fastest-growing parts of our mission--in implementing, verifying and enforcing arms control agreements, in regional arms control and confidence building, or in relevant export control and sanctions regimes such as the Wassenaar Arrangement and the Missile Technology Control Regime.

But I hope even this outline has been enough to support the conclusion that arms control is a vital and growing national security mission-- fully warranting what President Clinton has called "the most ambitious agenda to dismantle and fight the spread of weapons of mass destruction since the dawn of the nuclear age."

For the overriding reality is that we live in a dangerous world--one still bristling with the overarmament of the Cold War, and facing new dangers of proliferation, convulsive nationalism, terrorism, drug trafficking, and many others that directly affect us.

For as far as we can see into the future, that will require defenses second to none. And for precisely the same reasons, it will require assiduous and creative efforts to control arms.

For we have demonstrated in one hard-won agreement after another that when we control arms we control our fate...buttress our freedom...enhance our security and our prosperity.

Now more than ever before, arms control must be a central element in the kind of unified national security strategy that befits a great power in a perilous world.

PLENARY SESSION I:
WARFIGHTERS' PERSPECTIVES ON ARMS CONTROL

Chair
General Eugene E. Habiger, USAF
Commander-in-Chief, U.S. Strategic Command

Dr. John R. Harvey
Deputy Assistant Secretary of Defense/Forces Policy

Rear Admiral Thomas F. Marfiak, USN
Director of Plans, U.S. Central Command

Lt Gen Eugene D. Santarelli, USAF
Vice Commander, HQ Pacific Air Forces

Air Commodore A.G.B. Vallance, OBE, RAF
Chief, Special Weapons, Supreme Headquarters Allied Powers Europe

Introduction

It is understandable why some perceive warfighting and arms control to be in natural conflict, for on the surface it appears as if arms control agreements threaten to remove from a commander's arsenal some of the tools deemed necessary to fulfill the combat mission. Along these lines, some posit that while the force planner/operator addresses one set of requirements, the arms control negotiator bargains the requisite capabilities away.

Others disregard this tension, perceiving instead a correlation which ties these two distinct missions together. This camp maintains that an arms control perspective has moved into defense thinking and that the warfighter views arms reductions as another asset in the arsenal, with measurable benefits.

Regardless of the line of thinking one espouses on this matter, it is clear that the relationship between the military and arms control is a significant one as a result of the fact that a number of arms control measures, such as treaty inspections and counterproliferation activities, involve the use of military personnel and, in the latter case, perhaps even combat operations.

To ensure that U.S. national security objectives are met, arms reductions must be administered wisely. As a hedge against potential future conflicts, the warfighter must have a strong voice at the negotiating table, primarily in interpreting the implications of arms reductions for national security. For example, there was consensus among the panelists that while future options might change, for now, a strong nuclear deterrent must be maintained. With nuclear testing no longer an option, however, as a result of the Comprehensive Test Ban Treaty (CTBT)--the terms of which the United States agreed to last year--stewardship of the aging U.S. nuclear arsenal has become an arduous task requiring close coordination between the Departments of Defense and Energy.

Arms Control: A Tool of the Warfighter

During the Cold War, the Soviet imposition of order and even terror provided an uneasy stability to the international landscape. Since the Eastern Bloc's demise, however, the spread of regional conflicts

has filled the vacuum and now constitutes perhaps the greatest threat to U.S. and Western interests. A rise in the number of regional hot spots, coupled with the growing availability of sensitive materials and information, has simultaneously led to an increase in the proliferation of weapons of mass destruction (WMD). Consequently, with increasing frequency, military planners and strategists are becoming less certain of the type of enemy they will be confronting in the future. Whereas in the Cold War the scope of the conflict was somewhat defined, questions abound at present regarding how confrontations will develop and who will be involved.

The panelists agreed that the high level of uncertainty within the current international environment has made arms control an extremely useful tool for the warfighter. Arms control agreements benefit the warfighter by limiting, or at least defining, the weapons at the disposal of a particular state. They help set the norms and scope of engagement while offering tangible evidence were a nation to violate conditions of an agreement.

Reducing Arms With Caution

In order for arms control to be effective, arms negotiators must proceed with caution. A defense policy official contended that with the termination of the Warsaw Pact, conventional forces have played and will continue to play a greater role than previously. However, a credible nuclear capability is still a valuable tool in deterring aggression. While relations between the United States and Russia have improved in recent years, a change in the opposite direction could ensue. Yeltsin's hold over the reins of Russian leadership is tenuous at best, a fact which causes concern in the eyes of U.S. leaders, especially when considering that Russia still possesses a large nuclear arsenal.

One panelist pointed out as a cautionary note that the United States and Russia are approaching the nuclear issue in very different ways. While the United States has not produced any new nuclear weapons since 1991, Russia replaces its stockpile just about every decade. The Russian system is much more expensive, but can be expanded more easily if necessary.

A panelist added that while the pursuit of arms control is indeed a noble endeavor, negotiators must recognize the fact that weapons that are destroyed cannot be retrieved. Thus, it is extremely important for the United States to look before it leaps.

A number of panelists contended that arms control negotiators must proceed cautiously, given the inherent risk of cheating in any regime. There is clear evidence, for example, that as the United States and its allies pursue arms reductions, rogue states like Iran and Iraq strive to augment their WMD (as well as conventional) stockpiles.

The Problem of Iran and Iraq

The Middle East is the region where arms control is perhaps most urgent. Plagued by the proliferation of weapons of mass destruction, many of which are chemical and biological, the Middle East is a good example of how international arms control treaties do not necessarily guarantee global security. Adding to the region's volatility, Iran, Iraq, and Libya are threshold nuclear states which use the threat of WMD employment as a means of achieving status within the international community.

One panelist from a combat command argued that the Middle East is particularly important from an economic perspective because its countries are key choke points for the flow of energy. An interruption in this flow would be highly destabilizing both politically and economically. The region is difficult to deal with because there

are only a few arms control agreements and many of the countries are not subject to symmetrical constraints on their activities.

Maintenance of a stable economic environment is of paramount importance in the region for the future of arms control. The United States can address the proliferation threat originating from the Middle East by maintaining a ready military force; imposing restrictions on the export of dual-use technologies; and keeping control, compliance, and effective deterrence in the region.

Changing the Regional Focus of Arms Control

After World War II, U.S. arms control efforts became focused on Europe. The recent resurgence of China's power and presence, the ever-changing political and economic dynamics in the Asia-Pacific region, and the threat of WMD proliferation make it prudent for national leaders to include and maybe even feature the Asia-Pacific region in their arms control plans and endeavors.

The United States has been expanding its trade with the region at a furious pace. In fact, the Asia-Pacific region accounts for approximately one-third of the world's production output and has an impact on one in eight American jobs. In Southeast Asia, where economies have expanded significantly in recent years, large expenditures have been spent on infrastructure.

Politically, the region is undergoing somewhat of a facelift as China has assumed authority over Hong Kong and North Korea teeters on the brink of upheaval. Clearly, recent events provide evidence that China is challenging the United States as the preeminent power in the region.

One panelist contended that the United States must strive to address incidents within the region separately and each state individually. The all-or-nothing approach to arms control, which is the current U.S. policy, may cause conflict to erupt, especially on the volatile Korean peninsula, where one million soldiers are poised for action along the demilitarized zone between North and South Korea. Continuing this "all-or-nothing" approach may, in fact, destroy the tenuous balance that exists in relations between the regional powers, making the threat of one state setting off the nuclear trip wire even more ominous. Thus, with respect to arms control, an alternative approach, perhaps similar to the Conventional Armed Forces in Europe Treaty, might be adopted for the Asia-Pacific region as well as for other areas.

Nuclear Stockpile Stewardship

In light of its commitments to reduce its nuclear weapons arsenal and terminate all testing of nuclear weapons, stockpile stewardship is one of the United States' most critical national security tasks. The panelists articulated the need for wise investments in proper stockpile sustainment and stabilization measures. If the United States continues to commit to effective stewardship measures, the current strategic arsenal should serve until about 2025. Because of the stockpile's age, however, successful stockpile stewardship will entail difficult decisions as well as a significant amount of financial resources.

The maintenance of a safe and reliable stockpile under the CTBT is of supreme importance for ensuring the credibility of the nuclear deterrent. Currently, the Department of Energy (DOE), with much help from the Defense Department, has an aggressive, well-funded Stockpile Stewardship and Management Program to maintain the effectiveness of the stockpile without testing. As the stockpile ages and testing is no longer conducted, a determination will have to be made as to what activities should

be pursued to maintain it in a safe and reliable state. The most prominent elements of the stockpile stewardship program include enhanced surveillance; facilities and trained personnel; ensuring continued supply of tritium; improving the Department of Defense's use of DOE products; and development of criteria to demonstrate the safety and reliability of the stockpile.

One panelist noted, however, that with nuclear testing no longer being conducted and stockpile stewardship technologies not yet fully developed, the issue of zero-yield testing under the CTBT could create problems. Today's stockpile has been developed using information from past explosive testing. Consequently, routine problems can be rectified without the need for additional testing. Were the CTBT to go into effect as expected, stockpile problems might be much more difficult to correct. Another panelist noted, however, that this problem is not critical because there is a stipulation granting the President, in coordination with Congress, the authority to resume testing, were the reliability of the stockpile called into question for any reason, thus placing the supreme U.S. national interest (i. e. deterrence) in jeopardy.

START III: An Active Role for the Military

Panelists agreed that one of the most important factors for successful arms control efforts is communication - between members of the U.S. civilian and military leadership, among international leaders, and between military planners and arms control negotiators.

One example of the military's ever-growing and increasingly important role in arms control negotiations in recent years has been the work by the U.S. Strategic Command (STRATCOM) to help forge a commitment between the United States and Russia to pursue a possible third Strategic Arms Reduction Treaty (START III). Before President Clinton headed to Helsinki in March, STRATCOM convened a June 1996 meeting on the implications of reducing the nuclear stockpile to between 2,000 to 3,000 warheads; formed a Strategic Advisory Group consisting of past commanders-in-chief; and had a defense contractor conduct wargames examining nuclear warfighting scenarios. A panelist noted that in pursuing a START III agreement, civilian and military personnel have worked very closely to determine the implications of various rates and ranges. This panelist added that warfighters have particularly proved themselves essential for providing advice on the implications of U.S. actions.

Since the Helsinki agreement between Presidents Clinton and Yeltsin tied a future START III agreement to ratification of START II, the most pressing issues among military planners and arms control negotiators are how long the United States will wait for START II ratification and what are the potential consequences are of this waiting period. If START II is not ratified, the United States will likely preserve the option to hold its arsenal at START I levels, a policy reinforced recently by the Quadrennial Defense Review, even if this entails increasing the defense budget to meet the associated requirements.

The panelists expressed cautious optimism that Russia will ratify START II, particularly since that country will be at or below START II levels by 2005 because of the service life of its equipment. One panelist contended that START III negotiations will be extremely important because START I and II failed to address three issues: tactical nuclear weapons reductions, irreversibility, and transparency.

Arms Control Issues as the 21st Century Approaches

If arms control agreements are to be successful in the future, one panelist argued, participating countries must strive to eliminate the inherent distrust and lack of confidence prevalent in today's international environment. Accordingly, international leaders ought to place the same amount of emphasis on the demand side in arms control as the supply side. Recent agreements have focused too heavily on the prevention of uncontrolled technology diffusion. While this is important, emphasis should also be placed on the factors motivating states to acquire WMD and on regulating the types of weapons available to them.

Additionally, maintenance of clear limits and possibly even low expectations on what might emerge from the arms control process will contribute to the success of an agreement. The intentions and morale of the participants are determining factors in arms control. This is particularly relevant to the Middle East, a region in which many countries participate in loose agreements and are likely to continue doing so, despite the fact that rogue states like Iran and Iraq will probably never participate in such arms control regimes. The Middle East serves as a particularly good example of how, despite tensions and a substantial lack of trust and confidence among nations, arms control agreements can survive because of each nation's recognition of the benefits that can be fostered by collective compromise.

Another tendency among international leaders is to concentrate on proliferation of weapons of mass destruction. While this should certainly be a focal point of future agreements, the panelists concurred that consideration also must be given to the potential need for a renewed focus on conventional arms control. With the conclusion of the Cold War, nuclear weapons have continued to serve as an overall hedge while conventional weapons have become more capable and therefore, of greater concern. Consequently, a number of panelists predicted that international leaders will focus more attention on conventional arms control in the future.

Missile defense is an another arms control issue demanding increased attention as a result of pending arms reductions. In the United States, there is contentious debate centered around the best means of integrating multi-layered defenses. In Europe, however, the situation is more complicated. In fact, economic, political, and industrial factors all entered into the process of gaining an agreement on a NATO theater missile defense military operational requirement. NATO did, however, commit itself to an incremental approach. The spread of interest in missile defense systems is exemplified by the Asia-Pacific region, where application of ballistic defenses to counter air power is currently being explored seriously.

One final issue which may garner further attention over the next few years involves the proposal by a number of arms control experts to de-alert U.S. and Russian missiles. The panelists noted that both U.S. and Russian military planners have evaluated this proposal and found that it would be destabilizing if implemented. This is because the missiles would become easier to target if concentrated in a few central storage facilities.

Summary

If employed properly, arms control treaties can be extremely beneficial to the warfighter. Unfortunately, they are not a panacea to all ills which plague international relations in the post-Soviet era. It is for this reason that while the United States must continue its commitment to arms control negotiations, especially in uncertain and volatile areas of the world like the Asia-

Pacific region and the Middle East, a strong nuclear deterrent must simultaneously be maintained.

The panelists concurred that arms control can be quite beneficial to the warfighter, rather than diminishing the military's capacity to protect national interests. This is particularly true in today's international environment, where the motivations of both state and non-state actors are becoming more difficult to interpret.

For treaties to be most effective, a key role in negotiations must be played by the military, which has major responsibility for striking a balance between arms control and national security. Ultimately, it is the military who must use the devices and forces remaining after reductions to protect national security interests and, perhaps just as importantly, implement the terms of the negotiated arms control agreements.

PANEL SESSION 1:
THE MILITARY ROLE IN IMPLEMENTING ARMS CONTROL AGREEMENTS

Chair
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Deputy Minister for External Affairs, Republica Srpska

Major Davor Cutic
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Colonel Kenneth Guillory, USA
Commander, European Operations, U.S. On-Site Inspection Agency

Introduction

Since 1988, the United States and the countries of Europe have called upon their military services to provide inspectors, monitors, and escorts, and to plan for and execute the on-site and aerial provisions of arms control agreements. Military commanders have been tasked with meeting treaty obligations, preparing military sites for inspection, and hosting inspection teams. Troops serving at the front lines of arms control have been successful in making the case to their counterparts in the Balkans, the Middle East, South Asia and South America that arms control is a means to strengthen national security.

This panel session was divided into two consecutive subsessions. The first examined the broad military role in implementing arms control agreements. For example, a military perspective on establishing properly trained service components and preparing for and hosting foreign inspections was presented by a member of the United Kingdom Ministry of Defense. Particular emphasis was placed on operational considerations associated with working with alliance and treaty partners.

The second subsession addressed arms control experiences in the Balkans. The Bosnia-Herzegovina peace settlement provides an interesting case study in arms control implementation. The Dayton Peace Accords not only brought the fighting in Bosnia to an end, it also introduced entirely new concepts and experiences into the region.

The Military's Role in Arms Control

Although they are a somewhat rare event, live arms control inspections performed by military units require extensive

preparation. According to a member of the panel, preparation for arms control inspections includes four steps. First, the basic infrastructure for receiving arms control inspections must be set in place. Second, the military must provide information and advice that is accessible to parties at all times. Third, the opportunity to provide practice procedures must be provided on occasion. Finally, the military must be prepared to react to realtime requests when an inspection team arrives and a site is declared.

Much of the actual support provided by the military is information-oriented. For example, the U.K.'s Tri-Service Arms Control Implementation Directorate provides operational instructions for each type of treaty. These instructions detail the responsibilities of all participants, provide guidance on how inspections should be handled, and are updated frequently. The panelist also noted that several times a year, arms control staff officers' courses are conducted by military organizations such as the Joint Arms Control Implementation Group (JACIG). These are one-day courses designed to educate and update headquarters staff officers who are involved in arms control, to ensure that the necessary support is provided to all units. The JACIG also runs Unit Arms Control Courses throughout the year on a regional basis for all services and Ministry of Defense (MoD) establishments. The aim here is to ensure that each major unit liable for inspection has a capable arms control officer who fully comprehends the unit's responsibilities toward arms control. Many military arms control units are also responsible for producing, handling, and distributing video and other training aids, and making them available to all units for briefing their personnel on what to expect during an inspection.

With respect to infrastructure, the military is often largely responsible for the assembly of data, which, at least in the case of the Conventional Armed Forces in Europe (CFE) Treaty, are required for data exchanges. The United Kingdom sets aside a "Census Day," when each unit must report actual holdings of treaty-limited equipment through the chain of command. According to the panelist, a great deal of recounting takes place with command headquarters and equipment managers to eliminate repetition and other anomalies.

Perhaps the most important support provided at least by the U.K. military has been the staff assistance visit, where a member of the JACIG staff visits a selected major unit. Every major unit is likely to be visited once every two years. A visit usually includes reviewing the unit's plans with the arms control officer, examining site diagrams, and touring the site. Advice is then given on areas requiring attention. It is rare, the panelist explained, that everything is in perfect order.

One other crucial role that military arms controllers play is in the last-minute preparations conducted after an inspection has been called. In the case of JACIG, forward detachments are dispatched from the point of entry to the site by the fastest means possible, as soon as the target has been declared by the inspection team. The panelist indicated that for a CFE inspection, military units have a minimum of six hours to prepare for the inspectors' arrival at the site to be inspected.

The vast majority of arms control inspections have been conducted with a high degree of cordiality between inspectors and escorts, something which would have been unimaginable only a few years ago. Those diplomats and senior officers who are not closely involved in the arms control process are often misguided in their belief that arms control inspections are in some way an offensive operation--which is not the case, said a panelist. Inspections, in fact, have been instrumental in fostering the develop-

ment of confidence between member states, which is one of the principal aims of arms control.

Arms Control as a Political-Military Tool

The Dayton Peace Accord is a complex, well-balanced package of political and military arrangements that reflects a delicate compromise among the parties, argued one panelist. The arms control arrangements for Bosnia and Herzegovina are unusual for a number of reasons, offering an interesting case study for arms control.

First, these agreements were negotiated and implemented almost immediately after the end of a three and a half-year war, while under considerable pressure. Therefore, they are neither classic arms control agreements nor measures established for defeated countries, as in the case of Iraq. Additionally, the arms control package was built on the presumption of unifying the two entities into a single state with significant, but not all-embracing, powers.

Second, the arms control process has drastically changed the military balance in the country. The Republika Srpska has had to reduce its holdings of treaty-limited armaments, while the Federation has been allowed to build up its armed forces, to a great extent with foreign assistance. This has inevitably given rise to new threat perceptions and security concerns. Furthermore, the war mentality that prevailed during the first phase of negotiations coupled with the parties' almost complete lack of experience in the field of arms control has posed additional difficulties during the process.

Third, the Dayton Accords were negotiated in extreme haste. Consequently, far too little time was set aside for the confidence- and security-building measures to take effect. While Europe has had much experience in the implementation of arms control accords, problems arose in the Dayton case by trying to emulate agreements negotiated freely by countries devoted to building a cooperative European security architecture. The Bosnian agreements, implemented in an "unfriendly" environment where political pressure, rather than political will, was the main driving force of implementation, proved vulnerable to circumvention attempts.

Finally, the parties to the agreements tried to use arms control to hinder potential state-building exercises. For example, the finished arms limitations agreement could not be signed at Oslo because the parties could not agree on the placement and order of signatures. The Republika Srpska wanted to sign it as a full participant, while the Bosnian delegation wanted to ensure that the signatures were ordered in such a way as to make it clear that both the Federation and Republika Srpska were entities and, thus, not equal with the state of Bosnia and Herzegovina.

Arms control is, however, having a large influence on the political situation in Bosnia and Herzegovina. For the Republika Srpska, the peace agreement has led to a significant reduction of treaty-limited armaments and military capabilities. Implementation of these limits means that the military option--resumption of conflict in case political aims cannot be reached otherwise--is less tempting. Inevitably, this leads to the reduction of the influence of the military and the old guard of politicians who played a key role in preparing and conducting the war.

The panelist noted that because of the aforementioned problems, the arms control process in Bosnia and Herzegovina cannot yet be considered a stable and self-sustaining one. International pressure as a driving force of arms control implementation can be replaced only gradually by the political will of the parties through sus-

tained and comprehensive effort of the international community and of far-sighted politicians and military leaders in the region.

Improvements can be facilitated by continuing the comprehensive approach. According to the panelist, political pressure, international aid to economic reconstruction, assistance to the arms control process, reintegration of the country into international organizations, participation in the Partnership for Peace program, and links with the European Union should all be used to drive up the interest among the active population, especially the political elite, in a peaceful future for the region. A prosperous Bosnia that has been gradually integrated into European institutions, where borders and inter-entity boundary lines have less impact, is the only real "magnet" that can foster positive political will, this panelist argued. Unfortunately, this perspective is long-term, with little effect on the present.

The Serbian Perspective on the Dayton Peace Accords

Following years of some of the bloodiest conflict in Europe since World War II, arms control has brought the continent much closer to peace. International efforts to monitor and encourage the continued separation of three armies directly reduced the danger of the war continuing, according to a panelist representing Republica Srpska. However, achievement of a balance of power among former enemies has become one of the most complex and sensitive undertakings in the aftermath of the Bosnian War. The panelist from Republica Srpska noted that his country intends to fulfill its end of the bargain by destroying 1,108 weapons, even though this sub-regional arms control agreement favors the Bosnian Federation by two to one.

The new balance of power established by the arms control agreement and the "Equip and Train" program for the Federation army have, however, brought qualitative changes in the relationship between the former enemies. According to this panelist, the balance of power could be destroyed by the modernization and training of the army of Bosnia-Herzegovina. Thus, it is necessary to professionalize and modernize the weapons of the opposing army. This panelist stated the Serb army should not be condemned for responding to the modernization of its former enemy, because Serbia's weapons are quickly becoming obsolete due to the clandestine import of weapons by factions in Bosnia during and after the war.

Although arms control agreements often result in initial appeasement, they do not always result in the transformation of military doctrine. As armies become more professional and more mobile, they can develop an offensive capability as well as a defensive one. However, the only mission of the Srpska military in the postwar period, the panelist continued, is to defend the sovereignty and integrity of the Serb entity in Bosnia-Herzegovina. The intervention of NATO forces, which benefited the Croatians and Muslims, weakened the Serbs' hold on their strategic territory and contributed to their leadership's decision to build a strong defense capable of deterring future aggression against Serb territory. That decision, despite its shortcomings, guaranteed that there would be no winners in a future war in Bosnia-Herzegovina. Serbia's loss of fifty percent of its territory during the war, the unwillingness of the Third Yugoslavia to receive new refugees, and long-standing issues will probably make the Serbs more resolute to maintain possession of the territory during future aggression.

Because tensions are still present, a balance of military power must be maintained in order to achieve peace through arms control in Bosnia-Herzegovina. Many people in Srpska believe that complete demilitarization will foster peace. However,

the Srpska panelist noted that this decision might not be realistic. At the very least, this panelist stated, all parties should be offered the same guarantee for their safety. If the "Equip and Train" program ensures that Bosnia will be able to defend itself, then a similar agreement on safety guarantees should be offered to the Republic Srpska, argued this panelist.

Bosnian Views of the Dayton Agreement

Another member of the panel from Bosnia-Herzegovina had a somewhat different perspective about the peace process in Bosnia. Arguing from the standpoint of a Bosnian resident, this panelist noted that the Serb entity has contributed to the continuing tensions by denying the right of return to members of different nationalities. The Serbs, this panelist contended, have obstructed the return of refugees to places from which they were expelled. This member of the panel likened the Serbs' practice of refugee obstruction to ethnic cleansing.

The issue of freedom of movement is connected directly with the international community's desire to strengthen confidence- and security-building in Bosnia and Herzegovina, said the Bosnian panelist. Arms control means little, this panelist continued, if citizens belonging to a minority population cannot freely travel, or when they do, must confront constant danger.

The Bosnian panelist contended that the agreement concerning confidence- and security building measures has been well-received by many entities within Bosnia and Herzegovina. Considering the haste with which the cooperative measure was made, as well as the relative inexperience in arms control of most parties involved, the protocols have been successfully implemented and have had a deep impact on the situation in the former Yugoslavia. Perhaps most important, argued this panelist, has been the success of military liaison missions. Inspection missions involving military liaison inspectors were executed with few, if any, major glitches. The panelist noted that relations between commanding officers of the two sides was professional and fair, though provocation of inspection team members were present in several places.

This same panelist maintained, however, that arms control efforts like the Agreement on Confidence- and Security-Building Measures can have little impact unless there is vast improvement in the total political situation in the country. Problematically, the civilian segment of the Dayton Agreement has not been as successfully implemented as the military segment. For example, human rights have hardly been observed as ethnic cleansing continues with national and religious discrimination an integral part of the official policy being carried out by individual leaders, institutions, and political parties.

One way of removing this obstacle to the peace process would be to arrest and deliver indicted war criminals to the International Justice Tribunal, said this member of the panel. This signed contractual obligation is being openly violated. Arms control measures have little impact on establishing confidence among the Bosnian population, this panelist argued, when indicted war criminals move about freely.

Information Exchange and Verification in Regional Arms Control

The implementation of the Dayton Accord is not proceeding precisely as planned, according to a panelist representing the Organization for Security and Cooperation in Europe (OSCE). The OSCE has continued to face problems traditionally present during the peace-building process, such as a lack of communication and coordination and an inefficient utilization of resources.

In an environment like Bosnia-Herzegovina, where none of the three armies won or lost the war, the risk of initiating a new conflict or arms race is great. Therefore, urgency was a key component of the peace-building process, said the OSCE panelist. The Dayton Accord, which formed the basis for peace in this region, stressed the importance of time limitations and assumed that NATO forces would withdraw by the end of 1996. Therefore, the OSCE had to put two agreements, on confidence- and security-building and sub-regional arms control, respectively, into place as quickly as possible. Implementation had to start immediately after the negotiations were complete due to the urgency of the peace process. Implementation was difficult, said this panelist, because the Agreements were put into place hastily. To ensure successful implementation of the two agreements, the OSCE should have developed a plan grounded upon the social and political influences within Bosnia-Herzegovina, and then should have created an organization capable of quick implementation. Unfortunately, OSCE's failure to accomplish this jeopardized the success of the two agreements.

The underlying philosophy that shapes the pertinent elements of the Dayton Accords is reduction of risk by lowering significantly the potential for military surprise. An exchange of information between militaries will establish openness and transparency, which can then be validated by on-site inspections. Unfortunately, confidence is not being built through information exchanges and inspections. The verification process tends to prove that the information exchanges between the parties are invalid because each side often understates its equipment holdings. The OSCE representative expressed fear that the parties are losing confidence in the Agreement and that this lack of confidence will spill into the associated arms control agreements. It is crucial, therefore, that the parties participate in a valid information exchange to foster confidence-building in the arms control process.

Another factor contributing to the lack of confidence in the Agreement was the inspectors' lack of experience and expertise. In order to establish confidence and begin weapons reductions as soon as possible, inspections had to begin very quickly. This lack of training contributed to the growing sentiment that the Agreement was not functional. However, the OSCE had no choice. Proper training had to be sacrificed because of the urgent need to implement the inspection process. Unfortunately, the parties were and are still not prepared to manage an effective verification regime; they need time to build the necessary infrastructure.

The panelist stressed that to improve the effectiveness of inspections, it is of the utmost importance that individual countries and organizations like NATO offer training, seminars, and mock inspections to prepare the parties adequately for this process. The parties are more likely to accept offers for training from NATO than from the OSCE because they believe this enables them to insulate themselves from one another during this process. Some of this training occurred during the peace process in Bosnia-Herzegovina, but it was not nearly enough to prepare the parties for what lay ahead.

Summary

This panel session dealt with both general and specific aspects of the military's role in implementing arms control agreements. In the first subsession, panelists agreed that as the inspected party, a military unit must be well prepared to receive an inspection; part of this preparation is the ability to respond to requests in real time. The providing of information necessary for treaty implementation, inspection, and veri-

fication has become a principal military function in arms control. Accordingly, by providing information and thereby enhancing trust and confidence between signatories to an arms control agreement, the military has served to help build cordiality between states, especially in Europe.

The Dayton Peace Accord for Bosnia-Herzegovina, discussed mainly in the second subsession, provides an interesting look into the elements which are of increasing importance to present and future arms control efforts. The panelists expounded on some of these aspects, alluding to the strengths, weaknesses, challenges, and opportunities of each. For example, one panelist from the United Kingdom explained the important role played by the military in recent arms control operations. He said the military's most critical role is the dissemination of information and advice to units who may, at a moment's notice, have to perform an inspection.

Additionally, a number of panelists provided their impressions of the Dayton peace process, especially regarding arms control efforts like the Agreement on Confidence- and Security-Building Measures. There was consensus that despite the haste with which agreements such as this were implemented, arms control measures have been quite effective in quelling the tensions which have caused the bloodiest conflict in Europe since World War II. A Serb panelist noted, however, that one of the biggest challenges will be achieving a continued military balance in the region. If one side were to perceive itself as substantially disadvantaged, conflict could erupt again. A Bosnian panelist had a different perception, contending that arms control measures will have little impact unless civilian measures addressing human rights and war crimes take shape.

The comments from both of these panelists illustrate how difficult arms control implementation can be. While an arms control measure may appear promising in theory or on paper, the political will of national leaders can easily damage its impact.

PANEL SESSION 2:
BALLISTIC MISSILE DEFENSE FROM DEFENSE PLANNING AND ARMS CONTROL PERSPECTIVES

Chair
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Office of the Secretary of Defense

Dr. J. David Martin
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Dr. Alexander Pikayev
Carnegie Endowment for International Peace

Ambassador David J. Smith
President, Global Horizons

Introduction

Controversy has surrounded the subject of ballistic missile defense (BMD) since at least the late 1960s, when the Anti-Ballistic Missile (ABM) Treaty was being conceived, negotiated, and debated. The controversy continued to rage, of course, during the era of the Strategic Defense Initiative (SDI). More recently, East-West nuclear tensions have abated and the stability/instability arguments upon which the traditional BMD debate was focused may even have become less critical; nevertheless, the controversy has taken on new life and even new forms, for several reasons that are endemic to the current international security environment.

First, many argue that the end of the Cold War and demise of the Soviet Union have made the ABM Treaty an irrelevant artifact of the Cold War. Second, the growing threat of missile proliferation, it is argued, generates a requirement for missile defenses--national and theater--and raises technical and political issues concerning the demarcation between them. Finally, the ongoing and prospective reductions in American and Russian nuclear arsenals elicit new questions about the implications of BMD for stability and deterrence, as well as new arguments concerning the utility, maintainability, and effectiveness of strategic defenses. The intent of this panel discussion was to capture the various sides and arguments of the BMD controversy, in light of current and projected political-military missions and requirements.

Stresses on the ABM Treaty

Ballistic missile defense is currently a contentious issue on both the international and domestic fronts. At the heart of the debate is the ABM Treaty, which, now more than ever, is under a number of stresses, many of which are longstanding. According to one panelist, the Administration is working diligently to create a mutual understanding between the United States and Russia regarding these issues.

A major stress on the treaty, at least from the U.S. perspective, is that it seems counter-intuitive to limit defenses in light of offensive weapons proliferation. Particularly in recent years, U.S. legislators have attacked the grounds upon which the ABM Treaty was signed in that it seems logical to support systems which provide the best protection against potential threats. On this

motivation alone, many have argued that the ABM Treaty is outdated and must be revised.

The status of Soviet air defenses has also been mentioned by U.S. critics of the treaty. When the treaty was signed in 1972, Russia had about ten thousand air defense interceptors, many of which were capable of defending against ballistic missiles. This is a longstanding issue that was exacerbated by the failure of the second Strategic Arms Limitation Treaty (SALT II), which was intended to be the centerpiece of U.S.-Russian negotiations on limitations to arsenals of strategic offensive weapons. Devoid of a SALT II context, the issue of Soviet air defenses was never fully resolved, further augmenting questions surrounding interpretations of the ABM Treaty.

The failure of SALT II caused other contentious issues to surface, especially in the mid-1980s. For example, the Soviet Union became irritated over NATO's deployment of theater missiles, which in turn caused delays in talks on intermediate and shorter-range nuclear weapons as well as a potential agreement on strategic arms reductions. Under President Ronald Reagan, U.S. funding of the SDI became another point of dispute.

A recent development adding significant stress onto the ABM Treaty has been the general decline of the Russian military. Following its debacle in Chechnya, the Russian military has failed to generate confidence among its personnel. As a result, a number of U.S. experts and leaders have questioned the need for spending a vast amount of precious resources on missile defense. In light of the deteriorating Russian threat, many Americans contend that missile defense is a poor investment steeped in Cold War thinking.

Nonetheless, others argue that the decline of the Russian military and of Russian military power supports the need for effective and elaborate missile defense systems, for at least the following reasons: (1) the increased risk of accidental or unauthorized missile launch from Russia on account of weakened command and control; (2) the possible rise in proliferation by former Soviet client states to fill the vacuum left by the collapse of the Soviet Union; and (3) the increased risk of missile proliferation from former Soviet states in need of foreign markets and currency. A number of U.S. officials and experts, including one member of the panel, contend that the ABM Treaty is a Cold War relic that neglects to serve current U.S. national security interests and for this reason, ought to be scrapped. In contrast, Russians are overwhelmingly in favor of maintaining limits on missile defense systems as stipulated by the ABM Treaty because they do not have the resources to develop a similarly advanced missile defense system. They also oppose U.S. plans to develop a national missile defense system because according to their interpretation of the ABM Treaty, such systems are outlawed.

Yet another stress on the ABM Treaty is the debate over START II ratification in the Russian Duma. The concerns articulated by Russian legislators over START II naturally contribute to the unwillingness of both sides to come to terms with the ambiguities and flaws inherent in the ABM Treaty. One member of the panel added that a future stress on the ABM Treaty will be the evolution of Theater Missile Defense and other BMD technologies. As the efficacy and precision of systems grow, ambiguities within the treaty will become even more apparent. Concomitantly, the maturation of technologies will likely add to the growing disparity in capability between the United States and Russia, especially as the United States dedicates more resources than Russia to system development.

The Need for Missile Defense

The traditional notion of deterrence is still a principal element of U.S. national security policy. The maintenance of a substantially large arsenal of nuclear weapons will prevent other nations, especially rogue states, from directing attacks using weapons of mass destruction at the United States or its allies.

Missile defense is an integral part of the U.S. national strategy because deterrence, while effective, is not fullproof. According to one member of the panel, there are a number of regions from which threats to U.S. national security may originate. The states of the former Soviet Union are perhaps the greatest area of concern for the Administration; at present, Russia maintains a large strategic nuclear arsenal. While measures like the Cooperative Threat Reduction program are extremely useful, the possibility of accidental launch or the proliferation of loose nukes is still a major cause of concern among U.S. leaders. The uncertain political future of Russia, as well as the increasing popularity of nationalist hard-liners and their call to continue modernizing the Russian military, adds to the Administration's espousal of a strong missile defense policy.

Another potential threat to U.S. security, this panelist noted, is China. Echoing other panel members and conference attendees, this panelist articulated the notion that the direction of Chinese foreign policy is virtually impossible to predict. The United States must be prepared, however, to address the Chinese threat, which, considering China's arsenal of intercontinental ballistic missiles and improved nuclear weapon technologies, is quite serious.

Besides the possible threat from these two traditional powers, the administration also cites the need for a strong missile defense arising from conditions throughout the world, especially in North Korea and Iran. The urgency of the North Korean threat has declined since the United States and North Korea signed the Agreed Framework in October 1994. Additionally, production of fissile material for nuclear weapons has ceased under monitoring by the International Atomic Energy Agency. Nonetheless, the Administration is still wary of North Korea's intentions, especially as a result of the latter's continued export of ballistic missiles and related technologies. A Department of Defense report last year stated that under the right conditions, North Korea could launch an attack supported by chemical weapons and Scud missiles against South Korean targets. The North's nuclear weapons arsenal contains, among other technologies, Scud-B and Scud-C ballistic missiles, the latter having a maximum range of 500 kilometers. North Korea is also in the late stages of developing the Nodong missile not only for its own use, but for proliferation purposes as well. Additionally, the North Koreans are developing new missile systems--the Taepo Dong 1 and Taepo Dong 2--which have estimated ranges greater than 1,500 and 4,000 kilometers, respectively.

Iran is arguably the greatest threat to stability in the Middle East, even though its scientific and technical base is insufficient to support major nuclear programs. In recent years, Iran's Islamic government initiated weapons-related nuclear efforts, despite being a signatory of the Nuclear Non-Proliferation Treaty. While Iran's new political leadership is a major question mark, the United States is still concerned about nuclear technology which has been supplied by Russia and China.

In light of these threats to U.S. national security, the Administration has embraced the need for strong theater missile defense systems. According to one member of the panel, a U.S. government priority is to continue funding and developing a family

of theater missile defense systems. The Department of Defense's TMD plan is intended to protect forward-deployed and expeditionary elements of the U.S. and allied armed forces from ballistic missiles. These systems, which include the Army's Patriot Advanced Capability-3 and Navy Area Defense, build on existing infrastructure and prior investment.

A substantial portion of the missile defense budget, one panelist noted, has also gone toward upper-tier systems which are necessary to defend wide areas, defeat longer-range ballistic missiles, and increase theater commanders' effectiveness against weapons of mass destruction. However, according to the panelist, technical difficulties continue to delay deployment of the Theater High Altitude Area Defense system, DoD's chief upper-tier TMD program.

Administration Perspectives on the ABM Treaty

The U.S. Administration maintains that the ABM Treaty, despite its flaws, is still an important tool in relations between the United States and Russia. The treaty, one panelist contended, has been very useful in meeting its goal of prohibiting effective nationwide defenses against strategic ballistic missiles.

In order for the bilateral treaty relationship to progress, however, work has to be done to correct its ostensible flaws. The absence of clearly defined treaty parameters has cast uncertainty on the legitimacy of U.S. and Russian weapons technology development. With an international environment growing ever more unpredictable, the administration's philosophy has been to build defenses against all theater ballistic missiles, up to the CSS-2, which has the longest range of the so-called theater systems. One panelist noted that the Administration's goal is clear-cut: fund programs that address these threats but do so in the context of the ABM Treaty.

The problem, noted the panelist, is that the Administration is not exactly certain of what it can and cannot do. Primarily, Article 6 of the treaty states that no theater missile defense capabilities are allowed to counter strategic ballistic missiles. The definition of a strategic ballistic missile is noticeably absent from the treaty. Furthermore, the treaty does not specify how the capability to counter can be measured; in other words, the treaty fails to spell out what would have to be deployed in order to violate the treaty.

Under President Clinton, the United States has initiated a review of what constitutes strategic or national missile defense (NMD) and TMD systems. Negotiations in one form or another are still underway, although consensus appears to be a long way off.

The Impact of Helsinki

The consensus of the American panelists was that effective NMD and TMD are in the U.S. national security interest. According to one panelist, because of this requirement, the ABM Treaty must be revised to reflect current conditions of the international environment. Even though the United States faces circumstances, national security challenges, and threats unimaginable during the period in which the ABM Treaty was created, the treaty is still held sacrosanct, embellished, and even implicitly stretched to U.S. relations with states altogether unconnected with the treaty.

According to this panelist, this dogmatic approach stands the logic of arms control on its head, in that arms control must serve the national security interest, not vice versa. Arms control treaties must adapt to changing times and changing national security interests if they are not to fall by

the wayside as irrelevant or even inimical to one or both parties. Those who wish to preserve the treaty should be eager to negotiate changes that fit the times.

A member of the panel added that the recent Helsinki Summit between Presidents Clinton and Yeltsin confirmed the fact that the ABM Treaty is not being adapted to U.S. national security interests. Instead, it is being modified to strengthen and perpetuate the treaty in its Cold War form and to insulate it from meaningful change. From this line of reasoning, the panelist predicts that turbulent times will follow domestically and internationally. This includes the intensification of the debate between the Administration and Congress. Additionally, America will grapple with itself and with Russia over BMD program compliance with the ABM Treaty, especially with respect to the contentious demarcation issue. Finally, technology and post-Cold War multipolar geopolitics will increase the ballistic missile threat to the United States, reducing Helsinki and the ABM Treaty's 25th anniversary to irrelevance.

The panelist faulted the Helsinki Summit for not bringing the demarcation issue to closure. What it does, unfortunately, is make the ABM Treaty a cornerstone of stability, linking the treaty's preservation to reductions in strategic offensive forces, which are laid out in START I and II. The linkage established at Helsinki, argued this member of the panel, allows Russia to reassert its pretense that it is uninterested in START II and a potential START III agreement without getting its way on the ABM Treaty. The result, the panelist contended, will be to prolong and, therefore, to jeopardize START II ratification and START III negotiation, while allowing the protracted START process to obstruct U.S. NMD development and any meaningful ABM Treaty modifications.

Regardless of whether eventual agreement to follow up on Helsinki is reached, the Summit provides insight into the principles which underlie the thinking that will weigh heavily in the near term. This panelist further predicted that program managers should expect to confront bits and pieces of Helsinki over the next few years.

The Russian View

Disagreement between the United States and Russia over the ABM Treaty results from one simple fact, said the Russian member of the panel: The United States and Russia are completely different states with different national interests based on their unique geographical positions, threat assessments, and geopolitical objectives. While Russia has concentrated its foreign policy efforts on the "near abroad," the United States has continued to participate in global operations--Haiti, Bosnia, and Rwanda serving as recent examples. Thus, in contrast to the philosophy of the Russian leadership, the United States places much greater emphasis on TMD. Russia's major problems are internal or regional; consequently, vast resources do not need to be spent on elaborate TMD systems necessary to protect troops abroad.

The contention that different attitudes are espoused by both countries is exemplified by the relationship each state has with Iran. Whereas Iran and the United States view each other as enemies, Russia considers Iran a partner. Russia's different attitude toward missile defense and the ABM Treaty stems from the fact that Russia's geographical location makes it more vulnerable to shorter-range weapons. This is important to understanding some of the differences between the United States and Russia regarding the ABM Treaty. While Russia feels vulnerable from shorter-range weapons, the United States is threatened by longer-range missiles from rogue states like North Korea and Iran. Russia perceives its

burden to be more immediate and real, and thus, much greater.

The Russian panelist contended, however, that there is room to achieve some common ground. He argued that were the aforementioned ambiguities, including the demarcation question, left unresolved, other agreements, such as START II and START III, would be in serious trouble. Real reductions in offensive nuclear weapons are basically impossible if there is no agreement on defensive strategies. He added that it is vital to include among future U.S.-Russia ABM negotiations discussion on the relevance of new technologies. For example, as stockpiles are reduced and missile defense systems are deployed, there is the potential that new missiles would be made to penetrate existing TMD and NMD systems. Because of America's comparatively large defense budget, this is mainly a concern of the Russians, who deem such a scenario as destabilizing.

The picture the Russian member of the panel painted of the Helsinki Summit was not as negative as other panelists' in that he felt a small amount of progress was made and that real improvements could be made if the United States continued to express its support for a START III agreement. This would appease many Russian concerns about American intentions, which have been quite ominous in light of the unyielding U.S. support for NATO expansion.

One issue that could garner significant attention in future months is the possibility of linking a revised ABM Treaty with a START III agreement. Observers contend that were the two heavily debated treaties linked, some common ground could be forged. Citing its implausibility, this idea was struck down by the Russian member of the panel, who added that this notion exemplifies the American position that arms reductions and weak missile defense are mutually incompatible.

Summary

Questions concerning missile defense capabilities, particularly the continued relevance of the 1972 ABM Treaty, remain contentious issues among foreign policy and defense officials, as well as arms control policy makers and analysts. The American panelists, in general, argued that the emergence of new and projected proliferation threats, possibly undeterrable, and the growing concern about accidental or unauthorized missile launches from Eurasia have increased the need for national missile defenses. According to this view the proliferation threat also necessitates theater missile defenses to protect American troops and allies abroad. In addition, missile defenses can provide a hedge against possible deterrence shortfalls stemming from ongoing and prospective reductions in nuclear offensive forces.

There was much disagreement between panelists with respect to the future of the ABM Treaty. One member of the panel vehemently argued that the document was outdated, and because it no longer serves U.S. national security interests, ought to be scrapped. Others from the Department of Defense argued that the Helsinki agreement struck down major barriers between the United States and Russia. They argued that Helsinki proved progress could be made, and that it is still in the United States' interest to preserve the ABM Treaty and maintain it as the cornerstone of strategic stability. If commitment by U.S. and Russian leaders continue, there is much hope, these panelists believe, in resolving some of the longstanding demarcation questions and ambiguities which have plagued the ABM Treaty.

Russian officials and analysts view the situation from the standpoint of their own country's national position and interests. In the final analysis, they support the continuation of the ABM Treaty in its origi-

nal form, though for different reasons than their American counterparts. For example, Russia potentially faces shorter-range missile threats than the United States. In addition, the state of the Russian economy prohibits Russia's competing with the United States in the defensive arena. The Russian member of the panel, holding out the prospect of the United States and Russia achieving common ground, argued that discarding the treaty would jeopardize Russian ratification of START II and a future START III.

Finally, the panel discussion made it clear that BMD and its arms control ramifications will remain an area of contention, not only between the United States and other countries, but also among interested and informed persons within the United States and even the broader international community.

PANEL SESSION 3:
INTERNATIONAL ARMS CONTROL TECHNOLOGY EFFORTS

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Introduction

Prior to the conclusion of the Cold War, arms control was defined within the context of U.S.-Soviet relations, and arms control agreements were verified almost exclusively through unilateral national technical means such as space-based detection systems. As arms control moves forward in the present era, both the treaties themselves and the means for verifying them are becoming increasingly complex and intrusive. This trend began with the Intermediate-Range Nuclear Forces Treaty and has continued with the Chemical Weapons Convention (CWC) and the Comprehensive Test Ban Treaty (CTBT).

The effective verifiability of arms control treaties and other arrangements requires that monitoring technologies be pushed well beyond their current capabilities and that their availability be widespread, particularly as arms control has become multilateral in character. No single nation can afford to bear the technology development burden alone, nor can nations be asked to deploy sophisticated monitoring technology which they had little or no role developing and which, therefore, they might view with suspicion. The purpose of this session, in light of these changing conditions and requirements, was to explore how to broaden the prospects for joint research and development where other nations will be asked to participate in such cooperative efforts, preferably from the beginning.

Evolving Verification Demands

The international security environment in the aftermath of the Soviet collapse has seen the emergence of diverse new threats, a development which has been paralleled by a change in the approach to arms control initiatives and their instruments of verification. According to one U.S. panelist, the wake-up call alerting the United States and its allies to the growing danger from new weapons of mass destruc-

tion (WMD) came when Iraqi nuclear, chemical, and biological weapons programs were discovered by international inspection teams under United Nations auspices. The use of sarin gas by the Aum Shinrikyo cult in Japan served as additional warning of the potential threat posed by terrorist and sub-national groups. According to this panelist, the acquisition of WMD technology by less developed nations, through either indigenous production or technology transfers, demands a change in the traditional unilateral approach to arms control and its verification.

This panelist argued that while recognition of the diversity of WMD threats did not occur until after the Soviet collapse, the threat was no less real during the Cold War. Rather, the threat from rogue states and state-sponsored terrorist organizations was masked by a bipolar mindset. Inattention to these threats, he continued, can be explained by the U.S. governments's espousal of the nuclear deterrent strategy, which was designed to counter a Soviet threat that was regarded as far superior to any other. Little attention, it was thought, should be paid to states less capable than the Soviet Union.

In recent years, in contrast, there have been a number of multilateral arms control initiatives. Just in the past four years, the Nuclear Non-Proliferation Treaty (NPT) has been indefinitely extended, the CWC has entered into force, and the CTBT has been signed.

There is reason to believe that elements of both the new multilateral approaches to arms control and the traditional means of multilateral verification can be meshed together. No state, including the United States, can claim to possess the resources and scientific capabilities to provide unilateral verification for a multinational arms control initiative. Furthermore, a unilateral approach would certainly face resistance from less developed states, which would perceive unilateral verification as reinforcing the technology gap between the industrialized and client states.

Instead, new multilateral approaches to verification must be examined. Suggestions for implementing multilateral verification measures include the following: (1) Advanced states might transfer verification technology to arms control organizations, like the Organization for the Prohibition of Chemical Weapons. (2) Multilateral organizations and industrialized states may make an effort to develop verification technologies jointly in order to better pool scientific data and resource burdens.

Leaning Forward in Arms Control

Pending and future multilateral arms control agreements will require new approaches to creating and implementing verification regimes, as happened with both the CWC and the CTBT. One panelist evaluated examples, from agreements that were concluded in the past, of cooperative approaches to the development of verification components, applying those lessons to the new requirements and modus operandi of multinational verification regimes.

For example, the success that had been achieved in implementing a verification system for the CTBT was described. Though CTBT is one of the most technically complex arms control treaties created, the negotiations on the verification regime at the Conference of Disarmament (CD) produced surprisingly few chasms between parties. The panelist attributed the high degree of cooperation to the collective efforts on developing and implementing verification technologies which took place prior to the negotiations.

The work, done by the Group of Scientific Experts, was organized several years before the actual CTBT negotiations

were conducted. The Group was given an open-ended mandate, which permitted technical development and cooperation to continue in spite of political disagreements. According to the panelist, this Group represented a low-risk forum for multinational exchanges of verification technologies and approaches. The political ramifications of this low-level cooperative model were several-fold.

Primarily, the Group served to remove misunderstandings about verification technologies and the manner in which they would be implemented. Technology assessments and experiments conducted within the Group provided all parties with a mutual technical understanding, and, thus, the opportunity to share verification information. Furthermore, the United States was able to introduce technologies into a cooperative framework, as opposed to the unilateral imposition of technology, a possible approach that was criticized by several panelists.

Drawing on the CTBT experience, the panelist specifically advocated international cooperative research and development efforts in the area of nuclear treaty management, such as the Fissile Material Cut-Off Treaty (FMCT). The establishment of a Fissile Material Experts Group (FMEG) could serve to provide states with a common technical baseline for verification technologies and perhaps provide an outlook as to how inspections would occur. Prior to political negotiations, the FMEG could address and determine the key technical criteria and fundamental terms surrounding the treaty. These definitions could be used in identifying sites subject to verification; the characteristics which will determine what fissile materials will be subject to cut-off; collection methods, sampling, and handling procedures; cost trade-offs; and on-site inspection methods. The FMEG could provide political representatives with the technical basis to enter into negotiations with a common understanding of--and confidence in--the verification regime supporting the treaty.

Arms Control Challenges of Tomorrow

Real "new thinking" about emerging and future security threats and the arms control initiatives necessary to counter them should focus primarily on two areas. First, the ability to conduct information disruption or warfare will become increasingly available to a multitude of states and terrorist groups. In this era of information warfare, command, control, and communications systems will be targeted frequently.

Although the belief is commonly held that the United States dominates in the use of information technology for military operations, one panelist argued that any advantage currently held by the United States will be short-lived. Just as chemical and biological weapons are dubbed a "poor man's nuclear bomb," information disruption will also become a weapon of choice for less industrialized states and terrorist groups. Its ability to incapacitate or disrupt an adversary with minimal casualties at an extremely low cost makes information warfare an attractive option, this panelist argued.

The second challenge to security will stem from small-scale, localized chemical and biological attacks. The ability of these weapons to invoke public panic, demoralize governments, splinter alliances, and circumvent traditional notions of deterrence demand the constant monitoring of small-scale chemical and biological weapons.

Key infrastructure components are almost exclusively the targets of information disruption and chemical and biological attacks. Just recently, the Presidential Commission on Critical Infrastructure Protection concluded that the infrastructure

elements most vulnerable to attack are: telecommunications (information and communications), energy (electric, oil, and gas), transportation, banking and finance, water supply, emergency services, and continuity of government.

Such elements of infrastructure are particularly vulnerable to these threats for several reasons. The increasing national and global interdependence among infrastructures like banking, finance, and energy means that the impact of isolated disruptions can have a global resonance. The wide range of threats, both physical and electronic (via the internet), increases the likelihood that protection systems will be overextended. Industries like transportation and energy are greatly dependent on information technology, such as air traffic control or the regulation of power stations. Lastly, the movement towards deregulation, particularly in the United States, has reduced the redundancy and diversity of systems and prompted private companies to focus resources on competitiveness to the detriment of protection.

The nature of threats likely to be faced in the coming century demands a radical new thinking concerning current approaches to arms control, this panelist contended. Traditional measures, such as bans or limitations on weapons systems or data declarations and inspections, are incompatible with an information disruption threat.

This panelist offered potential paths to assess accurately the scope of such a threat and to cope with the new demands that they will place on global security. For example, an arms control paradigm for the 21st century should focus on international infrastructure assurance. Obtaining a clear understanding of the scope and complexities of this threat is a precondition for action.

An infrastructure assurance plan would include four main elements: The first is prevention, meaning the determination of an accurate threat assessment and risk analysis of vulnerable infrastructures. This element would include education and planning, as well as both industry and public awareness. Second, threat mitigation must include the establishment of international industry security standards, including contingency planning, risk management, and cost-benefit analysis. Third, preparations for emergency response to both information disruption and small-scale chemical or biological weapons attacks should require interagency cooperation, training programs, detection sensors, and emergency management. Finally, preestablished plans for recovery, including decontamination and remediation, should be in place.

This panelist also argued for an international approach to infrastructure assurance, while maintaining that the United States was uniquely well-suited to leading such an international endeavor. Programs of this type are already underway in the United States, such as the President's Commission on Critical Infrastructure Protection. Federally funded operations aimed at emergency response and inter-agency coordination would provide a model for international programs.

An essential element of a global approach to infrastructure assurance will be international information sharing, complete with open discussions concerning pathways of vulnerability and methods of protection against the coming threats of the 21st century.

Cooperative Monitoring

The new international security environment poses encouraging opportunities for world leaders, along with some difficult challenges, offered mainly by regional conflicts and the proliferation of weapons of

mass destruction and their delivery systems. On the positive side, opportunities will arise from new efforts to establish regional dialogues and confidence-building measures designed to reduce the likelihood of conflict.

In light of this situation, development and implementation of new approaches to preventing the proliferation of weapons of mass destruction are essential. American arms control efforts have traditionally emphasized aspects of denial. Supply-side factors, such as access to information, technology, and the materials necessary to build such weapons of mass destruction, have historically been the objects of U.S. concern. Though still important, however, these focal points are being increasingly perceived as less critical. Consequently, what is of greater importance, a member of the panel contended, are initiatives addressing the underlying motivational factors which drive states to seek WMD--that is, factors on the demand side.

Cooperative security arrangements are perhaps one place to start, stated this panelist. The implementation of such agreements requires, however, the creation of both technical and institutional infrastructures, including the necessary organizations for promoting, implementing and carrying out the provisions of cooperative agreements. Unfortunately, many countries lack sufficient infrastructure to take full advantage of these opportunities. In contrast, the United States and Russia, for example, have had decades of experience negotiating and implementing arms control agreements; as a result, over the years a substantial institutional framework has developed. This includes governmental institutions (such as the U.S. Arms Control and Disarmament Agency and the On-Site Inspection Agency), along with academic institutions, that have helped arms control become an element of U.S. national security policy.

The technical infrastructure to support implementation and operation of such agreements is also required. This consists of the technology and the technical expertise to develop and deploy monitoring systems necessary for establishing compliance. Much of this role has been fulfilled in the United States by the national laboratories. Similar infrastructure will be required as other regions begin the process of implementing such agreements.

Furthermore, education and training of experts and policymakers is essential to establishing the indigenous capability, this panelist explained. Such education must focus on both the theoretical and technical aspects of arms control and other security arrangements.

Many of these requirements are being fulfilled by cooperative monitoring, a form of cooperative security that has shown great promise. Cooperative monitoring complements, but does not replace, national technical means. The data collected are made available to all parties to an agreement, under the presumption that procedures are in place to deal with any anomalies or ambiguities in the data. Cooperative monitoring can take place between two countries, groups of states in a region, or among the wider international community. It can be a function of bilateral or multilateral agreements. In some cases, cooperative exchanges of information can occur between non-governmental groups such as scientific or environmental organizations; the only requirement is that two or more parties agree to exchange and share information.

One of the most common misconceptions about cooperative monitoring is that if countries cannot reach an agreement that provides very high levels of transparency and assurance, then monitoring is not an option. In fact, the panelist argued that most cooperative monitoring begins at the

low end of the cooperative spectrum and progresses only as confidence is gained and political environments evolve to levels that support more intrusive, transparent, and comprehensive monitoring.

Cooperative monitoring can also contribute to the resolution of nontraditional security challenges such as monitoring agreements on the distribution of natural resources or on environmental pollution. In addition, monitoring is an important component of efforts to open borders to international trade and to stop illicit activities, such as smuggling and illegal immigration.

International Perspectives on Cooperative Monitoring

The issue of cooperative monitoring initiatives within the framework of multinational arms control agreements and the associated implementation problems were examined by non-U.S. members of the panel. The panelist from France discussed the implementation issues surrounding verification technology which arose during the convening of the Preparatory Commission of the CWC. The movement toward multinational arms control agreements, a trend which all of the panelists recognized, places distinct demands on verification regimes supporting such treaties. Several unique characteristics were identified by the panelist, based on his experiences within the Preparatory Commission.

The level of intrusion into the private sector is far greater because of today's multinational agreements with on-site inspection provisions, in comparison to traditional arms control agreements, in which verification depended nearly exclusively on national technical means. As greater demands are placed on industry, the risk of the loss of confidential business information will grow, resulting not only from the on-site inspections but also from technology sharing.

The panelist also spoke on the subject of the interaction between competitive commercial interests and multinational technical cooperation. Decisions within the Preparatory Commission on specific technologies to be employed for verification were encumbered by national and competitive interests. Representatives from states parties regarded technology determinations as an opportunity to showcase their indigenous verification approaches. Finally, the need to create a balance between technology demands and the interests of states parties and commercial entities is essential for successful cooperative monitoring.

The Russian panelist related his experiences with seismic measurement technology and its application in the CTBT. He contended that an increasing number of states will soon be capable of fielding developed monitoring technology, an advancement which will, in turn, aid them in implementing cooperative verification initiatives such as seismic monitoring in support of the CTBT. The acquisition of such monitoring capabilities by more states will likely increase, given the spread of information technology from the major powers to developing states.

Summary

The Post-Cold War security environment is rife with new threats, but corresponding means to reduce these threats are available. Traditional arms control initiatives--bilateral treaties dependent on national technical means of verification--have given way to multinational approaches complete with cooperative monitoring regimes. Threats like information disruption and localized attacks on infrastructure, with or without WMD, defy traditional arms control solutions; new thinking at both national and multinational levels will be required. Furthermore, this multinational approach must also address the global diffu-

sion of technology, which is both part of the solution and part of the problem.

Construction of a verification regime for a multinational arms control agreement presents different challenges than those associated with traditional agreements. Disparities in technology among states requires that a common understanding of verification technology requirements be achieved prior to political negotiations. The opportunity for scientific exchange prior to political agreement will serve to lessen negotiating impediments by building trust in the regime and promoting transparency. Cooperative verification approaches, when based on information sharing and joint development of technology, will provide the confidence necessary for multilateral arms control agreements to address the threats of tomorrow.

PANEL SESSION 4:
THE APPLICATION OF TECHNOLOGY TO REGIONAL ARMS CONTROL

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Introduction

No discussion of the defense implications of arms control can be complete without considering the role technology plays in the implementation of negotiated and verifiable measures. In fact, the success of recent developments like the extension of the Nuclear Non-Proliferation Treaty, the entry into force of the Chemical Weapons Convention, and the signing of the Comprehensive Test Ban Treaty (CTBT) is due in large part to progress in and wide acceptance of technologies which can be incorporated into critical tools for implementing and verifying these arms control regimes.

Technology's applicability to arms control has increased mainly because of the growing emphasis on verification measures, as well as the trend in international relations toward regionalization--exemplified best by the growing multinational character of security arrangements and arms control regimes. Arms control technologies have played an integral role in helping these international groups and bodies mitigate the regional tensions which have flared up since the end of the Cold War.

The focus of this discussion is on technology's role in arms control, as well as some of the opportunities and challenges associated with efforts intended to establish dialogues and confidence-building measures to reduce the likelihood of regional conflict and the proliferation of weapons of mass destruction (WMD) and their delivery systems. Asia is pivotal to the development of future arms control agreements; consequently, pending events in the region--particularly in the South, where tensions between India and Pakistan prevail--are a cause of both continental and global concern.

Cooperative Security

The demise of the Cold War and the break-up of the Soviet Union created new challenges to the international environment. Among the most urgent of these is the need for new approaches to preventing the proliferation of WMD, as well as an understanding of the motivations that drive countries to seek these weapons.

Historically, the emphasis has been on denial, particularly of the information, technology, and materials necessary to build

WMD. Though still important, these efforts are increasingly perceived to be insufficient. Members of the panel posited that innovative approaches are likely to come out of measures centering upon cooperative security, which can be defined as a commitment by a group of governments to develop and enforce accepted rules through mutually agreed and applied measures.

Cooperative security enhances conflict prevention and mutual reassurance in three ways: by preventing threats from occurring rather than preparing to counter threats; by preventing tools of aggression from being assembled; and by sharing information which offers reassurance to the international community. Cooperative security helps reduce the motivation to acquire WMD by alleviating concerns about the intentions of potential adversaries and by involving more countries in global and regional arms control agreements. Examples of cooperative security include arms reduction and arms limitation treaties, confidence-building efforts, and transparency measures--all of which seek to restrict weapons and activities.

Technical collaborations are a key element for achieving cooperative security agreements. In this vein, experiments with monitoring technology--such as testing sensor systems in an appropriate environment and understanding the impact of monitoring technology on routine activities--can prepare for cooperative monitoring in the future. According to one member of the panel, technical experimentation should help to establish the necessary infrastructure for implementing agreements, to attract knowledgeable experts capable of assisting negotiators, and to build a constituency for cooperative security in the technical community. Joint projects among two or more countries, said the panelist, will help pave the way for implementation of future agreements and will help build trust among the participating technical communities.

Cooperative Monitoring

With arms control garnering increasing regional security interest, the lack of regional technical expertise is becoming more apparent. Cooperative monitoring, which can be defined as methods and activities for obtaining and sharing agreed information among parties, could help in this situation. Ultimately, its goal is to develop means of sharing information, including treaty verification systems, confidence-building measures, and international environmental monitoring programs.

Recent experiments in cooperative monitoring will help prepare for future cooperation. Examples of such experiments include the Los Alamos National Laboratory effort to conduct environmental monitoring near its nuclear facilities and provide the results to the public in real time over the internet, in order to allay public concerns about health hazards at the facility. Also, in anticipation of an increased future need for information sharing for transparency purposes, Sandia National Laboratories is developing multilevel security systems needed to share information on nuclear weapons dismantlement, which involves remote monitoring sensors providing information relevant to security, safety, and operational maintenance while protecting sensitive and proprietary information. Finally, joint U.S./Russian monitoring of weapons-grade fissile material is occurring at the Argonne West and Kurchatov Laboratories, with continuous on-site collection of information, mainly through sensor-triggered video images.

According to one panelist, experiments in cooperative monitoring can be applied to a wide variety of technical and scientific areas, including the following: (1) nuclear issues related to facilities, material transportation, and long-term spent fuel storage; (2) biological issues tied to disease monitoring and reporting; (3) training for

on-site chemical weapons inspections; and (4) conventional arms limitations and redeployments. With respect to nuclear facilities, cooperative monitoring can play a crucial role in improving safety and addressing proliferation concerns by improving physical security through collaborative research efforts on access control and physical protection, operational safety, and environmental protection. Another example of cooperative monitoring--cooperative use of sensor technologies--can also play a significant role in monitoring demilitarization or disengagement agreements, such as the 1976-1980 Sinai disengagement process.

Collaborative Material Protection, Control, and Accounting Procedures

The large and growing U.S. cooperative effort with the former Soviet Union (FSU) in the area of material control can serve as a model for future arms control and transparency activities, one panelist argued. The problem of nuclear material security in the FSU first came to light during the early stage of the Soviet Union's collapse at the beginning of the 1990s. Prior to that time, nuclear material security under the Soviet system relied heavily on the use of internal security and severe penalties. The dissolution of the Soviet Union led to the erosion of the internal security system, economic difficulties, increased crime and black market activities, civil unrest, and a failure to implement new measures.

The material protection, control, and accounting (MPC&A) effort under the Cooperative Threat Reduction Program got off to a slow start in 1993 with government-to-government efforts on low-enriched uranium. It began to gather momentum in 1994 when there was a heightened emphasis at the political level, which in turn led to an increased commitment to lab-to-lab projects. By 1995 there were significant concrete results from the lab-to-lab initiatives; consequently, such efforts were expanded to 44 locations in 1996.

The lab-to-lab efforts have succeeded for a number of reasons, including the provision of adequate funding for the Russian partners, the use of Russian equipment where appropriate, the establishment of mutual respect and trust, support by Russian leadership, flexibility and patience, and the alignment of capabilities and responsibilities.

Work conducted under the MPC&A program has focused mainly on physical protection measures, including the use of bar-coding technologies and physical inventory methods. A number of networked computerized material control and accounting systems have been installed to verify nuclear material inventories rapidly and provide data on materials to a central, site-wide system, which will in turn report data to national MPC&A systems.

The MPC&A program has also done much work with radiation detection and measurement methods. In this area, portal monitors, pedestrian monitors, and hand-held detectors have proven useful; work is also being conducted on vehicle monitors. As part of this effort, a drive has been underway to foster development of Russian technologies, including both vehicle and portal monitors. With regard to radiation measurement, numerous technical exchanges have taken place on gamma spectroscopy, while some have also occurred on neutron detection. These technologies could prove particularly useful in a future transparency regime, and the extensive technical exchanges and training sessions which have taken place could serve as an important stepping stone to broader interactions.

South Asian Perspectives on Arms Control

A couple of institutional problems with respect to arms control technology exist in India, one panelist explained. First, instead of using military expertise during the arms control process, these countries make foreign service officers their dominant voice in negotiations. Rather than fully taking heed of the issues particular to those countries, the foreign service officers, at least with respect to India, tend to take posturing positions. Another major problem inherent to the Asian arms control experience is that leaders often fail to include the technical community in the negotiations process.

As an undeclared nuclear-weapons state, India is an important factor and sometimes an active player in international arms control efforts. Interest in the case of India is amplified by the nation's contentious relations with its neighbors, China and Pakistan. According to the member of the panel from India, after years of conflict between the two nations, relations between India and Pakistan remain volatile despite the implementation of confidence-building measures in 1992. Unfortunately, these talks, which were primarily initiated to appease the United States, were derailed and have been dormant since 1994. Similar to almost all Chinese international relationships at present, the one between India and China remains uncertain, although in 1996 the two states reached an agreement on the establishment of confidence-building measures. Tensions between India and China have, of course, risen in recent months as a result of the alleged transfer of nuclear technology from China to Pakistan. Nevertheless, Sino-Indian relations have improved over the long term because diplomats from both countries have been able to set aside their border dispute. Unfortunately, this is not true in the case of Indo-Pakistani relations, where long-standing tensions over the control of Kashmir supersede discussion of any other topic.

India is undergoing heated internal debate on arms control and the future of its nuclear weapons policy. Domestic leaders and outside experts have criticized the way discussions are being handled, such as the clear absence of government institutions--the military serving as the most prominent example. Currently, discussion centers around the potential consequences of abandoning the nuclear option.

The panelist noted that averting conflict in a nuclear South Asia is of primary importance both within the region and globally. A clear first step, said the panelist, would be to limit the size and scope of nuclear forces throughout the region, including China, Pakistan, and India. In the past, India has supported bilateral arms control measures while wary of a multinational forum where the United States might assume leadership of the group. Although U.S. contributions are often deemed suitable to the global arms control process, the South Asian panelist contended that sometimes its role in regional discussions is not appreciated.

It would be useful, the panelist said, if the United States focused more attention on crisis management and strategic stability in the region. The United States could also help regional arms control by formulating the right political ambiance, with issues being couched as internal to the country rather than being forced from the outside.

Chinese Attitudes toward Arms Control Technologies

In China, the concept of cooperative efforts for reducing arms is a relatively new phenomenon. Just within the past decade, China has made arms control a key aspect in its attempts to enhance national security with its neighbors. As a result, the Chinese

government began encouraging groups to conduct research in this area and established several institutions to address arms control issues; technical support, for example, is now being provided for negotiations.

The rapidly developing and expanding technologies and techniques, once reserved for the arms race during the Cold War, are playing an essential role in the field of verification compliance with treaties, agreements, and confidence-building measures, said the member of the panel from China. In a number of cases, the application of verification technologies has become indispensable to the successful implementation of treaties and agreements.

Once implemented, the CTBT, for example, will apply a wide range of technologies to verify compliance with the treaty, including seismic, hydroacoustic, radionuclide, and infrared monitoring technologies as well as some on-site inspection measures such as aftershock, ground penetrating radar, and others.

In order to support future arms control agreements, it is necessary to establish a verification mechanism that is cost-effective, not overly intrusive, and non-discriminatory, argued the Chinese panelist. This is a challenge because only through collective multinational efforts can these requirements be met. Furthermore, treaties that possess such verification mechanisms are likely to attract more states, thus further promoting the arms control process.

The member of the panel from China contended that satellite remote sensing is a promising technology which could help meet the above requirements in the verification of future multilateral arms control treaties, agreements, and both global and regional confidence-building arrangements. Traditionally, the cost of satellite remote sensing was high. As a result of the rapid development of commercial satellite imaging systems throughout the world, today's existing commercial systems are already far superior to those of thirty years ago and no longer monopolized by the superpowers. In a few years, for example, satellite imagery with a resolution of one to two meters will be sold on the commercial markets, with multi-spectral imagery from space following soon after.

Space-based monitoring, the panelist argued, fulfills a much-needed requirement for a cheap, effective, and less intrusive technology than some other verification measures. The one-meter to two-meter resolution that satellites are now capable of achieving can provide extremely useful information which can be applied to the monitoring and verification of multilateral agreements and confidence-building measures. Another advantage of space-based monitoring is that it does not infringe upon territorial airspace. Consequently, remote sensing is viewed as a less-intrusive technology, even though satellite imagery with one-meter to two-meter resolution can provide useful information about a region's terrain, infrastructure, and military activities.

According to one member of the panel, cooperative monitoring efforts which use this technology could strengthen agreements. While a space-based system has the potential to contribute to the monitoring of arms control compliance, efforts aimed at promoting other technologies may also be necessary. A member of the panel stated that one good project geared toward this goal has been the information exchanges occurring as part of China's confidence-building agreement with Russia.

Summary

With greater frequency, arms control treaties are including cooperative verification measures, including requirements for on-site inspections. Consequently, technol-

ogy is playing an increasingly critical role in the arms control process. Panel members expounded on some of the means by which technological advances are being implemented, as well as the challenges in regions like Asia, where, while arms control is necessary, technical and institutional infrastructures are lacking.

Asia is one area where collaborative technological efforts like cooperative monitoring might have an important impact. Asia, as members of the panel noted, is a volatile region with a number of lingering border conflicts. The situation is complicated by the fact that a few of these states possess nuclear weapons and delivery systems; their willingness to use them is still largely uncertain. Conditions like these make arms control efforts in the region even more important. A good first step, panelists noted, is to institute basic changes such as helping the military and technical communities get more involved in the arms control process. By adding these perspectives, the panelists noted, Asian leaders might begin to shed longstanding preconceptions which have hindered progress in the region for years.

The session demonstrated that cooperative monitoring might be a good first step in making information and treaty verification systems available to nations lacking the necessary infrastructure. More than anything else, the panelists explained, cooperative monitoring fosters confidence among the parties involved. Confidence-building is particularly important in today's international environment, where multinational and cooperative security arrangements are the norm. One member of the panel argued that the U.S. collaborative effort with the FSU in the area of materials control could perhaps serve as a model for future bilateral transparency activities.

One concern echoed by panelists throughout the session is that advances in arms control technologies increase the possibility of overly intrusive on-site inspections. Members of this panel agreed that for progress in arms control to continue, there is a much-needed requirement for cheaper, more effective, and less intrusive technologies and verification measures. Satellite monitoring appears to be a very promising technology which fulfills these requirements, although it has not been comprehensively applied to the multilateral arms control process. Already a significant component in the framework of national technical means of verification, satellite monitoring taps into commercial capabilities, which are improving, expanding, and becoming more cost effective.

SUMMARY OF ADDRESS BY
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Despite disparaging press reports and accusations by non-governmental organizations (NGOs), the Department of Defense (DoD) has the technical and financial means to destroy safely and effectively the United States' stockpile of chemical weapons. Incineration, the technology by which DoD eliminates these weapons, has proven successful for years.

Johnston Atoll, which is located 700 kilometers southwest of the Hawaiian Islands, has hosted a pilot plant chemical demilitarization facility since 1985, and has experienced only minimal setbacks in eliminating the chemical weapons stockpile there. As of March 1997, the Johnston Island facility, JACADS, had a rate of recorded accidents per unit of time--1.6--which the U.S. Department of Labor rates "Superior." The petroleum industry is higher--still rated "Excellent," but with a greater number of recorded incidents--4.5. The JACADS facility, with the technology proven at Johnston Island, is even safer than beauty shops and shoe stores.

The Johnston Island facility has destroyed, as of May 23, 1997, over 1,300 tons in a pilot plant, including over 70,000 M-55 rockets. Operations have also begun at Tooele, Utah. Even though this facility is in its start-up phase, it has successfully eliminated 250 tons, including over 11,000 M-55 rockets. This has been done with only three unscheduled work stoppages, and no leakage to the environment.

The effectiveness of incineration has been supported by three independent National Research Council (NRC) panels, the General Accounting Office, and the Environmental Protection Agency, each of which has concluded that incineration is a safe and effective process. For example, Richard Magee, chairman of the NRC Stockpile Committee, determined that the baseline incineration system "was a safe and effective process for disposal of the stockpile." A 1994 study concluded that incineration with the pollution abatement system does not pose any health hazard. The NRC has not been able to find any readily applicable, viable alternative to incineration of energetic components, or explosives.

Thus, the obstacles threatening the timely elimination of the U.S. chemical weapons arsenal are political rather than technical in nature. Causing disruption in the flow of the program, primarily, are inconsequential lawsuits, delays in state permits, and adverse legislation. The innumerable, ceaseless and seemingly never-ending lawsuits brought forth by NGOs are more irritating to program officials than threatening, as exemplified by the Defense Department's near-perfect track record on chemical demilitarization issues in court. They take precious time and energy away from the program. However, time is of great importance now because the United States is under legislation to eliminate the chemical weapons stockpile by 2004; according to the Chemical Weapons Convention (CWC), those weapons will have to be removed by the year 2007.

The permit for Johnston Island, required under the Resource Conservation and Recovery Act (RCRA), took a year. The RCRA permit for Tooele, Utah, took three years. The permit at Umatilla, Oregon,

which was just recently issued, took eleven years. Anniston, Alabama, is still pending.

Another situation disrupting the flow of the program has involved delays in the granting of state permits. The perception among state officials is that by allowing chemical demilitarization procedures to take place, they are putting their individual communities at risk of experiencing an environmental disaster similar to that which took place in Bhopal, India, or Chernobyl, Ukraine. The Department of Defense cannot downplay or overlook the concern of state officials. Instead, through aggressive public outreach programs, DoD must strive to assuage the fears harbored by those in locations where chemical weapons are to be incinerated. It is not enough for the DoD to say "Trust us with your dear life," without thorough discussion and explanation.

In addition to the previously mentioned obstacles, program officials have had to carry on despite adverse legislation. The 1993 Defense Authorization Bill, which establishes what is called Alt Tech 1 (for Alternative Technologies), forces DoD to use something other than incineration at two of the bulk sites in the continental United States, that is, sites where the U.S. stores the chemical agent in ton containers. There are no energetics and no explosives associated with its storage.

In light of the program's time constraints and tight budget, it would be better to destroy the entire chemical weapons stockpile via incineration, since it is the only proven technology for meeting this objective. The 1997 Defense Appropriations Act contained the so-called Alt Tech II. The framers of the bill are looking for the philosopher stone, the stone that the National Research Council looked for a decade ago and has continued to look for since then, a way to eliminate assembled weapons containing energetics.

If the U.S. proceeds with incineration technology, the risk goes to zero, as quickly as DoD can get there. Alt Tech I, which will be applied to the bulk sites, will delay eliminations at those facilities. Therefore, the communities there will be exposed a little longer than they would have been otherwise. Alt Tech II, if successful, will probably find applications in Kentucky and Colorado. These communities will be exposed even longer.

Annoyances like these are amplified by erroneous press reports and the spreading of misconceived notions by disgruntled employees and hopeful contractors. In the absence of a balanced presentation, the public understandably becomes fearful. What the public thinks forces the elected and the appointed government official to think about as well. Permit delay and adverse legislation are the result. Bad news sells; thus, the press has placed the program under the journalistic microscope, arousing public fear often without conclusive evidence.

The *L.A. Times* and *New York Times,* in particular, have been a willing sounding board for comments by disgruntled employees. One manager, for example, sent a letter to his superiors. A portion of the letter later appeared in the *L.A. Times*, without, however, accurately reflecting the manager's position, as it quoted only those statements critical of the new Tooele chemical demilitarization facility.

Together, such irritants make the DoD's chemical demilitarization project that much more difficult. But while program delays are certainly a bureaucratic nightmare, they also increase the dangers associated with destroying these weapons. In essence, delay equals risk. This is because the longer the U.S. chemical weapons arsenal remains untouched, the greater the chance such weapons will leak their lethal

agents into the atmosphere and endanger the surrounding environment.

According to the National Research Council, there is forty-five times higher risk just letting the chemical weapons sit there than with the present elimination technology, which means that even if there were a risk-free technology for assembled weapons, it would not be worth the risk of forcing the public to wait.

PLENARY SESSION 2:
DEFENSE ISSUES IN A WORLD OF FEWER NUCLEAR WEAPONS

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Introduction

One of the most significant transformations wrought by the end of the Cold War was the rethinking among nuclear-weapons-state leaders regarding the future size and shape of each state's nuclear arsenal. While the proliferation of weapons of mass destruction is still among the chief threats to international security, few would disagree that the United States, Russia, and potentially the other declared nuclear powers are likely to continue reducing their nuclear stockpiles. This process of reducing arsenals--as well as the end state, whatever it might be in terms of force size, mix, and structure--has serious implications for the defense strategist, the force planner, and the military commander.

A number of steps have to be taken before serious reductions in nuclear arsenals can occur; most of these steps involve or affect the force planner and warfighter. From the U.S. perspective, progress in arms control is likely to be stymied unless the concept of deterrence is re-evaluated and then reapplied in U.S.-Russian relations. Some believe that the concept of nuclear deterrence ought to be preserved and the United States and Russia should eliminate their Cold War policies of threatening to use nuclear weapons in response to conventional, chemical, or biological attacks. This view holds that these policies are outdated and have far too many dangers associated with them.

For progress on arms control to occur, participating states must agree that their national security interests are not sacrificed by arms reductions. For example, many Russians believe that the future of START II is uncertain largely because critics have attacked President Yeltsin for signing an agreement that fails to address Russia's national interests adequately.

No debate over arms reductions can be complete without discussion about the legality and potential for certain types of missile defense systems, which are now a principal concern of warfighters and force planners. The necessity for advanced mis-

sile defense systems in light of two major contemporary issues in international relations--arms reductions and the threat of weapons of mass destruction proliferation--is a major issue, and a number of countries are concerned about the impact of national and theater missile defense systems on operational planning.

Revisions to U.S. Nuclear Weapons Policy

While deterrence is still a useful concept in international relations, it must be reassessed in order to reflect the realities of the post-Cold War environment. During the Cold War, nuclear deterrence was the foundation of the U.S. strategy for preventing both nuclear and conventional war, as there did not appear to be a better alternative. Even long-time proponents of nuclear deterrence must admit, however, that it possesses a number of shortcomings which are serious enough to warrant its reevaluation in light of the improved relations between the United States and Russia. For example, deterrence is likely to succeed only if there are credible plans for what to do if it fails, although constructing such plans is exceedingly difficult, and attempts to make the threat of nuclear retaliation credible can be perceived as aggressive advantage seeking by the other side. This exacerbates tensions, stimulates arms races, and increases the chance of nuclear war from crisis instability, miscalculation, or accident.

The dangers and dilemmas associated with the traditional superpower concept of deterrence ought to be alleviated by restricting deterrence to the core function of deterring nuclear attack, or coercion by threat of nuclear attack against the United Statès or its allies.

According to a panelist arguing this point, it entails incorporating three changes into the current strategy. First, the United States and Russia ought to decrease their alert procedures. Due to the inherent risk of a large-scale nuclear accident, the United States and Russia should cease configuring their nuclear forces for rapid reaction. During the Cold War, reducing the risk of a surprise attack appeared to be more important than the risks generated by maintaining nuclear forces in a continuous state of alert. Now, however, the opposite holds true.

Second, both nuclear powers ought to abandon the mass targeting strategy that was prevalent during the Cold War. Rather than possessing an inflexible, predetermined plan, the United States should adopt a strategy that would permit much more selective targeting options and that would be based neither on predetermined prompt attacks on counterforce targets nor on automatic destruction of cities. If used, nuclear weapons would be employed against targets that would be designated in response to immediate circumstances in the smallest possible numbers. Instead of mass targeting, the United States ought to embrace a strategy centered around adaptive targeting responses. In light of this new strategy, only a limited nuclear arsenal would be necessary, and it could be maintained on a low-level alert status.

Finally, deterrence should no longer be geared toward one country. For years, the U.S. deterrent strategy focused on the Soviet Union (and now on Russia), but in light of NATO expansion, which has amplified fears within Russia, it might be imprudent to develop a threat assessment based exclusively on Russia.

Rethinking Deterrence: New Thoughts on Meeting New Challenges

After nearly five decades of making deterrence the center of U.S. national security policy, it is timely and necessary to begin rethinking the role and requirements of deterrence in light of the demise of the Soviet Union as well as the emergence of hostile proliferators armed with biological,

chemical, or possibly even nuclear weaponry. It might be useful, a panelist argued, to consider three propositions when attempting to reevaluate the American concept of nuclear deterrence.

First, while nuclear weapons continue to provide a hedge against a breakdown of reform in Russia, the logic of nuclear deterrence might well hinder rather than support the emergence and normalization of a more cooperative U.S.-Russian political-military relationship. This is a possibility for a number of reasons, mainly psychological. Primarily, by definition, thinking in terms of mutual deterrence highlights the conflictual rather than the potentially cooperative aspects of U.S.-Russian relations. The logic of mutual deterrence also focuses attention on residual nuclear capabilities rather than on the great political and military changes that have reshaped today's security environment, thus making it more difficult in both countries to make the mental shift to no longer viewing each other as adversaries.

Instead, the logic of mutual nuclear deterrence must first be complemented by, then gradually subordinated to and eventually replaced by, a new logic of U.S.-Russian mutual strategic reassurance. This requires a practical commitment on the part of both the United States and Russia to take actions to enhance security cooperation and to lessen residual suspicions. Two good starting points to the creation of mutual strategic reassurance would be the effective implementation of a NATO-Russia Charter, as well as successful negotiations to modify the Conventional Forces in Europe Treaty. Additionally, the logic of mutual reassurance suggests that even more than future nuclear reductions, heightened nuclear transparency should be the centerpiece of the next decade's U.S.-Russian nuclear arms control agenda. This aspect of mutual reassurance might include a far more extensive program of exchanges of data, reciprocal stationing of military personnel at key strategic commands and sites, joint seminars, and joint research and development projects.

Second, deterrence is and will remain an important facet of the overall U.S. posture to contain new threats to the national security interests of the United States and its allies, particularly in preventing hostile rogue nations from attacking with nuclear, chemical, and biological weapons. This does not mean, however, that some of the most critical canons of traditional Cold War nuclear deterrence of Soviet aggression will not need to be modified. For example, during the Cold War, the assumption was that it was too dangerous to participate in any direct military clash with Russian military forces because of the risk of escalation to a devastating nuclear war. Now, however, in contrast to the Cold War situation, the risks of confrontation and military clashes short of war with hostile proliferators are considerably lower for the United States. Avoidance of any use of force must be considered a guiding concept.

Third, faced with growing concern about the danger posed to American society by use of chemical, biological, or perhaps even nuclear weaponry by subnational or terrorist groups, the United States needs to clarify the role of deterrence in helping to contain this threat. It was argued that deterrence would only be effective in meeting the nuclear, biological, and chemical (NBC) terrorist threat were the United States to maintain a credible threat of punishment. Certain measures, such as incorporating enhanced tactics to prevent a subnational group from executing a terrorist incident, could have an impact of limited deterrence by affecting terrorist perceptions about the odds of success or utility of the action. Nonetheless, reliance on the threat of punishment to deter terrorist use of NBC weaponry clearly would raise tough issues and painful choices. Unfortunately, it is impos-

sible to predict completely the impact of deterrence in helping to contain the challenge of NBC terrorism.

Status of U.S. National and Theater Missile Defense Systems

Interest in U.S. national and theater missile defense systems has grown significantly in recent years as a result of the burgeoning threat from rogue states and the potential for accidental launches of nuclear weapons. The United States' leadership in developing these systems stems from the U.S. perception that each nation has a legitimate right to defend itself.

The United States is developing missile defense systems on both the theater and national levels. The theater strategy, as articulated by one of the panelists, entails the deployment of a highly integrated, near-leakproof capability which will protect American forces on expeditionary missions far from the U.S. border. Such a system will also provide protection to allies in areas where American forces are deployed. The U.S. theater missile defense program includes multi-tier systems that operate in both the atmosphere and exoatmosphere. Currently, two lower-tier systems are being developed to defeat short-to-medium range theater ballistic missiles. The Army version, the Patriot Advanced Capability-3 (PAC), will improve the current force protection capability almost eight-fold. The Navy's system, Navy Area Defense, is being built on existing infrastructure and prior investment and is likely to be deployed in the year 2000.

The Defense Department is also attempting to develop a system--Theater High Altitude Area Defense (THAAD)--which will be able to counter nuclear, chemical, and biological weapons with a hit-to-kill technology. This flagship program has, however, experienced difficulty. According to one panelist, the problem with THAAD revolves largely around integrating the missile and weapon systems, and thus, is correctable over time.

While ensuring the safety of U.S. troops abroad is of great importance, systems are also being built to protect the continental United States from accidental missile launches and nuclear weapon attacks by rogue nations. The recent Quadrennial Defense Review added $2 billion to the U.S. National Missile Defense (NMD) program, which is referred to as "3+3" because it would take three years to develop and three years to deploy. Thus, initial deployment of an NMD system could occur in 2003.

One panelist noted, however, that the initially deployed NMD unit would have only a limited capability. It would be able to counter rudimentary ballistic missiles launched by rogue nations, but not sophisticated missiles from nuclear powers like China or Russia. This is because in order to combat technologically advanced missiles such as those that could be launched by the Chinese or Russians, the system would have to violate the Anti-Ballistic Missile (ABM) Treaty. At least at this point, it was noted, the United States seeks to make all NMD programs ABM Treaty-compliant.

Missile defense would become an even more important issue were Russia not to ratify START II. This is because the number of nuclear weapons available for accidental launch or use by rogue states or subnational groups would remain high. This argument met opposition by other conference attendees, who contended that missile defense will increase in importance as arms reductions are made, as a result of each state's vulnerability arising from a declining number of delivery vehicles.

International Perspectives

According to the panelist from the Russian Federation, it is perhaps too early to

determine START II or III's impact on the potential deployment of missile defense systems. If there is debate over missile defense systems, it will center around national rather than theater systems, because Russia's financial constraints and large land mass make the incorporation of an NMD system impossible. In essence, Russia does not have the resources to fund an NMD project that could protect the entire nation. Were the United States to proceed with the development of an advanced NMD system, there could be further obstacles in U.S.-Russian relations, especially if Boris Yeltsin were to be succeeded by a president with a more nationalist or hard-line agenda.

The consensus in the Duma on START II is that the treaty was signed by Yeltsin prematurely and without consideration of Russian national interests. The implementation of START II could be delayed by the need to consider changes sought by Duma members, changes that are compulsory for the treaty to be ratified. At the heart of this criticism, one panelist said, is that START II will be far more expensive for Russia to implement than START I. In fact, Russian leaders have calculated that in order to maintain strategic forces under a START II agreement, Russia will have to expend four times more resources than the United States.

Those Russians who criticize the START II agreement allege that it favors the United States. Under START I limits, Russia would have to produce only 490 new missiles. START II, however, allows each nation to deploy up to 2,000 Submarine-Launched Ballistic Missiles (SLBMs) and Intercontinental Ballistic Missiles (ICBMs). This measure in the agreement has a strong impact on the cost of implementation for Russia and the United States. The make-up of the U.S. arsenal determines that its expenditures will go only towards reducing the number of warheads on each missile. In contrast, the nature of the START II agreement forces Russia to destroy physically all of its SS-18 missiles. This has strategic implications because were the United States to pull out of START II, it would only have to put the downloaded warheads back onto the missiles. Since Russian missiles will be destroyed, they will be deprived of this opportunity. If the United States were to reload its warheads, it would have about two times the forces compared to Russia's deterrence capability.

Russian critics of START II, the panelist explained, propose to terminate the treaty's ratification process, based on the fact that conditions have changed to such an extent since 1993, when the agreement was signed by Presidents Bush and Yeltsin, that the terms are no longer applicable or fair. Instead, they have proposed a more aggressive agenda to accelerate the development of a program for new Russian solid rocket fuel and new ballistic missiles capable of carrying a sufficient number of MIRVs quickly. They also propose continuing the testing and development of a new ICBM based on knowledge of the new SLBM solid fuel missile. Before this new ICBM could be deployed in about 2010, existing SS-18 missiles could be used as launchers.

There is a particularly high level of pessimism in Russia at present, in large part because of NATO's decision to expand. Critics in Russia, like the aspiring politician Alexander Lebed, have compared the NATO-Russian agreement to Yalta. Nationalism is particularly high, other conference participants noted, in light of the Russian military's poor performance in Chechnya. From a nuclear weapons standpoint, Russians fear that as a result of the decision to expand NATO, the latter's forces will be able to deploy tactical nuclear weapons in Europe or the Baltics at any time in the future, making Russian strategic forces even more vulnerable.

The panelist from the People's Republic of China explained that while Japan has deep reservations about becoming a large nuclear power, it is quite likely to enter the missile defense market fairly soon. In fact, argued the panelist, there is already evidence that Japan is aggressively seeking ballistic missile defense capabilities. In large part this is due to developments in China, particularly the notion shared by many Asian leaders that China is attempting to assert its authority in the region. This panelist argued that, contrary to global perceptions, China is not a threat to any area in the world. In fact, recent actions like the China-Russia border disarmament treaty reflect the fact that China is a nation whose leaders are seeking nothing less than peace. Its national security mission is not to become a regional or global hegemon, but, rather, to maintain stability in Asia and throughout the world. Ultimately, China's policy is intended to augment its already growing economy.

This panelist added that lab-to-lab exchanges are one of the best ways of increasing communications between the declared nuclear powers. Programs like these are likely to lay the foundation for future transparency measures, which will be vital to any future significant arms control measure. Lab-to-lab exchanges, argued the panelist, increase mutual understanding, allowing national representatives to become informed about local conditions in other states.

Arms Control Issues as the 21st Century Approaches

There was consensus among the panelists that perhaps more than at any other time in history, there is now tremendous opportunity for progress in the area of arms control. Fulfillment of this promise may take time, however. In large part, this is because there are still many questions surrounding the current international environment. For example, unlike during the Cold War, there no longer exists a clear ideological dividing line separating friends and foes.

One panelist pointed out that the international landscape is slowly becoming dominated by three great powers: the United States, China, and Russia. In order to secure peaceful relations between these powers in the future, added the panelist, they must take full advantage of the opportunities which circumstances have afforded them at the present. Much of this entails opening communications and forging good relations between China and Russia. Another vehicle for change, contended the panelist, might be economics. With both countries increasingly opening its doors to capitalist ventures, economics could be a means with which to enhance national security ties between the two.

The point was also made that were progress in nuclear reductions to continue in the future, as arsenals trimmed down to the 1,000-missile level, other nations seeking opportunities to achieve superpower status may in fact increase their stockpiles. In the cases of Germany and Japan, for example, because of the advances made years earlier by the United States and Russia, both nations currently see no advantage to spending money on their nuclear arsenals. This could change, however, if the United States and Russia were to continue cutting their arsenals substantially and a pro-nuclear right-wing movement were to arise in Germany and Japan. In contrast to the current situation where the United States and Russia maintain huge arsenals, continuing reductions in these nations could invite other players to beef up their stockpiles and become nuclear players. While hypothetical, the situation necessitates thought, said the panelist, and illustrates the point that arms reductions do not necessarily lead to a lower number of problems within the international environment.

Summary

There is no doubt that we are moving toward a world of fewer nuclear weapons. Who possesses them and in what capacity is and will remain, however, largely uncertain. This makes the process of nuclear reductions an even more arduous task. A number of panelists contended that in order to address national security concerns while maintaining peace and stability in a world of fewer nuclear weapons, states will be required to sacrifice some of their traditional canons of security. One panelist suggested, for example, that in the post-Cold War world, relations between the United States and Russia can improve if each relinquished its attachment to the concept of mutual nuclear deterrence and instead embraced the notion of mutual strategic reassurance. Another suggested the United States and Russia decrease their alert procedures and terminate the mass targeting strategy, two tenets that have been at the center of U.S. national security policy for years.

While arms reductions are indeed burdensome for the civilian leader, as one panelist pointed out, they are arguably more troublesome for the warfighter and force planner, whose mission of protecting national security interests remains the same despite the smaller arsenal of tools at hand. In light of this observation, it is understandable why missile defense plays such a large role in arms control discussions. As commitments to arms reductions are forged, military planners look for new means of protecting not only their mainland, but troops abroad as well.

SUMMARY OF FEATURED ADDRESS BY AMBASSADOR ROBERT L. GALLUCCI

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While the demise of the Soviet Union was certainly a triumph for democracy, at the same time it generated a number of problems that, due to internal factors within the successor states, now threaten international security. Perhaps the greatest menace to international security at present is the availability of fissile material from Russia, a problem that has ballooned over the past six years due to rises in organized crime and corruption, afflictions which hinder government agencies from performing their job. Furthermore, Russian scientists and engineers have become increasingly disenchanted over the government's inability to compensate them for their work, enhancing fears of a Russian "brain drain."

The seriousness of the Russian situation is magnified by the intentions of rogue states such as Iran, Iraq, and Libya. For some years, these states have sought to acquire nuclear weapons in order to increase their status within the international community. During the Cold War, when the Soviet nuclear stockpile was far more secure, there was little concern over the ability of rogue states to obtain a nuclear device. Now, however, in light of the current domestic crises in the former Soviet Union, the availability of Russian scientists and fissile material has made the possibility of a terrorist incident involving a nuclear weapon much greater.

A scenario that has grown more plausible in recent years involves the smuggling of eight or more kilograms of plutonium into a rogue state which hosts at least one former Russian scientist or engineer capable of designing a nuclear weapon. The crude but workable nuclear device could be delivered to a subnational group less concerned about the consequences of being caught and whose actions would be much more difficult to trace. The device could, in turn, be detonated in an American city; a disaster of this type would be almost impossible to prevent, deter, or defend against.

The status of nuclear weapons proliferation is likely to remain uncertain for quite some time as a result of a number of unpredictable situations in Asia, most of which are influenced by China. The direction of Chinese foreign policy is largely unclear right now and might remain so for the next ten to fifteen years. For example, China may elect to limit its military modernization program while settling all border disputes peacefully. Alternately, it may opt to dedicate significant resources to its force projection capability, while simultaneously using military might in order to establish itself as a hegemonic power.

The direction of Chinese foreign policy is especially important in South Asia, where historically the relationship between India and Pakistan has been extremely unstable. Pakistan and India each has relatively few, if any, nuclear weapons, but the capacity to produce and deploy them is possessed by each. Were the conflict over Kashmir to ignite a dispute between India and Pakistan, it is uncertain whether or not nuclear weapons, perhaps aboard ballistic missiles, would be launched. Because of the history of tension between these two undeclared nuclear weapon states, more so than other regions of the world, there would

be an enormous incentive by each to strike. Because of its *de facto* alliance with Pakistan, China is an enormously critical player in the region, one which could defuse tensions or further disrupt the possibility of any peaceful solution.

Uncertainty in Asia is further exemplified by the cases of South Korea and Taiwan, two nations whose intentions to acquire nuclear weapons are very low, but whose capabilities are extremely high. It is a mistake to ignore these situations because they each can change quite rapidly. For example, following the North's eventual demise, the Korean peninsula will once again be united, leaving the nuclear policy of this nation an open question, in large part because of the uncertainty of China's future policies as well as traditional concerns over the influence of Japan and the United States in the region. Taiwan is also a potentially volatile situation due to domestic developments, Chinese impatience, and questions surrounding U.S. support for the preservation of Taiwan through peaceful means. Together, these issues could further ignite Taiwanese fears to such an extent that their nuclear posture could change substantially.

Given the nature of the world as it exists currently, we must preserve the most significant international arms control regimes. In maintaining regimes, however, the objective should never be sacrificed. The regime should never be put ahead of the objective, even if this means placing the regime's existence at risk. The Administration was heavily criticized, for example, over its nuclear reactor agreement with the North Koreans. The agreement was successful, however, because it preserved the most important element of the deal--preventing the proliferation of weapons of mass destruction.

While diplomatic solutions like arms control treaties are vital to the preservation of international security, they are possible only if sanctions or the use of military force are contemplated as potential options. Were sanctions or the threat of military force absent in the cases of Iraq or North Korea, for example, a negotiated settlement would have been virtually impossible. This is an important tenet of international relations in the post-Soviet era because, while the proliferation of nuclear weapons can be curtailed through the employment of an array of options, it is a problem whose solution will not be permanent.

PANEL SESSION 5:
THE VERIFICATION CHALLENGES OF REDUCING NUCLEAR ARSENALS

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Introduction

The end of the Cold War brought about a new international security environment that heralded the downplaying of ideology and the emergence of cooperation and partnership between former adversaries. The United States and Russia, instead of electing to continue building up their nuclear arsenals, began for the first time to embrace in a realistic manner the concept of nuclear weapons elimination. Thus, although nuclear weapons have been in existence for over fifty years and nuclear arms limitation concepts for over thirty, the idea of undertaking large-scale reductions in nuclear forces is rather novel. Understandably, the United States and the other nuclear-weapons states have little practical experience with the process of reducing nuclear weapons arsenals and disposing of the dangerous remnants.

In light of the newness of this thinking, it is striking that an abundance of information surrounding nuclear weapons elimination has appeared in the short period of time since the break-up of the Soviet Union, when the issue of reducing nuclear stockpiles first became a prominent issue in international affairs. Research efforts on this matter have produced key insights on such topics as verification, transparency, irreversibility, and stockpile storage, notions that were virtually unheard of a decade ago.

Illumination of some of the recently developed technical approaches in connection with nuclear weapons elimination, specifically those focusing on verification and transparency measures, will assist in planning for the future. For example, current initiatives in plutonium disposition, strategic arms control, and the monitoring of reductions in nuclear arsenals are key areas of interest.

While plans and initiatives based on laboratory research and roundtable discussions are vital to arms control and nuclear weapons elimination, they mean little unless they are implemented successfully. This can be quite a daunting task, as unforeseen challenges, particularly for transparency and verification, often arise during attempts to draw down and dispose of nuclear weapons.

Because so many of these challenges arise out of multinational projects, international agreements must be concluded, and protection, control, and accounting technologies must be developed.

Monitoring Reductions in Nuclear Arsenals

Current U.S. and Russian negotiations on the monitoring of warhead dismantlement have focused on transparency rather than verification, a panelist from the U.S. government explained. For example, in May 1995, Presidents Clinton and Yeltsin agreed to establish a stockpile data exchange agreement, to host reciprocal inspections to monitor storage facilities--specifically the excess material accumulated from the warhead dismantlement process--and to have spot checks of the fissile material portion of the stockpile data exchange program. These measures were and still are intended to enhance confidence between the states so that weapons eliminations can continue without delay.

Effective transparency, contended the panelist, is especially important in terms of facilitating the transition from a Strategic Arms Reduction Treaty (START) I and II-based nuclear force posture into one centered upon START III. Warhead dismantlement transparency initiatives have assisted in the START process, said the panelist, by laying foundations for further reductions as well as new requirements which are likely to be included in a START III agreement, such as new verification procedures for delivery vehicles and fissile material. Transparency was a prominent issue during the Helsinki Summit; in the joint statements, Presidents Yeltsin and Clinton agreed that a START III treaty ought to include measures relating to the transparency of strategic nuclear warhead inventories and the destruction of strategic nuclear warheads. In addition, they concurred that START III should include all other jointly agreed technical and organizational measures which promote the irreversibility of deep reductions, including prevention of a rapid increase in the number of warheads.

Many significant technical challenges have been created because of the new requirements imposed by Helsinki, said this member of the panel. Perhaps most important is the question of obtaining the knowledge that the item to be dismantled is actually a nuclear warhead. While this is quite difficult, it could conceivably be accomplished through the use of radiation measurements. The Department of Energy, for example, has the capability to x-ray or radiograph a warhead in order to confirm that the readings from nuclear material in storage containers are fully consistent with readings from a nuclear warhead. The problem with this procedure, however, is that it is very intrusive and could potentially give away highly sensitive design information.

Another related challenge requiring attention under a START III framework is the issue of confirming that the weapon destroyed is strategic and not tactical in design or application. Associated with this challenge is the question of how experts can monitor the dismantlement process in a manner that provides sufficient confidence that disassembly is taking place yet minimizes the disclosure of sensitive information. The panelist contended that under a weak transparency regime, balanced verification is hard to achieve because distinctions between strategic and tactical weapons are not easily made; a very strong regime, however, runs the risk of using overly intrusive monitoring procedures.

Four options were identified for monitoring the dismantlement of strategic warheads. The first option is the least intrusive. Here, monitoring is done only upon the receipt of the warhead and in component storage areas. The heart of the dismantle-

ment facility is left unchecked. This type of monitoring would include radiation measurements, inventories, and on-site inspections for recording purposes only.

The second option would offer increased bilateral confidence in the execution of the dismantlement agreement. It would entail setting up a continuous portal perimeter monitoring regime around a segregated section of the dismantlement area. This option is less intrusive because the portal perimeter would be established in such a way that stockpile surveillance and maintenance activities would be kept secret.

A third option would involve setting up a chain of custody system inside the dismantlement area up to the doors of the bays themselves--the place where at least in the United States, actual dismantlement operations take place.

Finally, the fourth option would be designed similar to the third option, though monitoring activities would actually extend into the bays themselves so that direct observation could be made of the ongoing dismantlement activities.

The panelist argued that the best option lies perhaps somewhere in the middle; the United States and Russia must seek monitoring procedures which balance intrusiveness and level of confidence, but do not affect the quality of operations.

Administration Views on Plutonium Disposition and Strategic Arms Control

With the release of Presidential Decision Directive 13 in September 1993, the United States adopted a policy of seeking reductions in the stockpile of separated plutonium worldwide. According to an Administration representative on the panel, plutonium disposition is vital to U.S. national security interests because it responds to requirements for the irreversibility of deep reductions, while also helping to ensure that plutonium does not fall into the wrong hands. Plutonium disposition was a major issue at the Helsinki Summit, as exemplified by the Joint Statement, which tasked the United States and Russia with developing measures relating to the destruction of strategic nuclear warheads, as well as technical and organizational measures to promote the irreversibility of deep reductions of all nuclear warheads.

Currently, the United States and Russia are actively involved in plutonium disposition. In January, the United States decided to pursue a dual-track approach of research and implementation for the disposition of excess U.S. plutonium. Decisions on the proportions of material to be immobilized will be determined in August 1998. Russia is working with France and Germany to develop a reactor-based disposition program. Additionally, Russia is working with the United States on three projects: One is geared towards converting plutonium separated from nuclear weapons into an oxidized powder form and then mixing it with uranium oxide; the mixed oxide (MOX) fuel can then be used in nuclear power plants. Another is associated with reactor modification assessments and safety studies, and the third is focused on small-scale tests and demonstrations of promising technologies and principles.

In September 1996, the Joint U.S.-Russian Steering Committee on Plutonium Disposition issued a report which concluded that immobilization and the "burning" of MOX fuel were viable alternatives for plutonium disposition procedures. These options, the report found, can dispose of fifty metric tons of plutonium within twenty to forty years even if the United States and Russia were to use different technologies. The committee is currently working on pit conversion and conducting experiments on technologies to convert plutonium metal to a MOX fuel suitable for a nuclear power

plant. In addition, the committee is pursuing a feasibility study for a pilot-scale plant in Russia. Future projects will focus on, among other things, the recoverability of plutonium from immobilization forms.

According to the panelist, there are a number of major issues associated with plutonium disposition that will likely take up much of the Administration's time during the ensuing months. With regard to preventing proliferation, attention will be given to the status of spent fuel, which is not to be reprocessed until excess stockpiles of plutonium have been eliminated. For transparency, the task is to assume that disposed plutonium came from dismantled weapons or equivalent stocks. The United States believes transparency measures are needed in the conversion of weapons plutonium to MOX, storage of weapon-usable materials, verification that plutonium has been burned in a reactor, and ensuring that excess fissile materials are not reused in weapons. Another Administration concern about plutonium disposition, said the panelist, is finding enough international public and private investment to build needed plutonium disposition facilities in Russia.

Ramifications from Helsinki

The recent U.S.-Russia summit in Helsinki focused mainly on the production of five joint statements addressing topics such as NATO-Russian relationships, economic activities beneficial to the Russian Federation, chemical weapons disarmament, threat reduction and strategic forces, and the Anti-Ballistic Missile (ABM) Treaty. According to one panelist who participated in the Helsinki negotiations, the last two statements were closely linked, and it is impossible to understand one without examining the other.

With respect to strategic arms reductions, both presidents agreed to begin negotiating a START III treaty that would cut the number of long-range warheads on each side to no more than 2,000 to 2,500 by the end of 2007. Additionally, the joint statement proposed requiring the destruction of warheads under inspection and disallowing the nuclear material to be used and reused. On the statement addressing ABM issues, the two sides agreed to allow the United States to proceed with all theater missile defenses under development. The agreement, however, limits the speed and range of interceptor missiles and stipulates that both sides are not to develop, test, or deploy space-based theater missile interceptors.

Prior to the Helsinki discussions, extensive preparation was done to ensure that outputs from the summit would be consistent with U.S. national security policy. This included a review by General Eugene Habiger, Commander-in-Chief of the U.S. Strategic Command, and Secretary of Defense William Cohen concerning U.S. deterrence policies and the force levels that would be sufficient to implement these policies. Out of this meeting, it was determined that official U.S. policy consists of three specific points: First and foremost, the United States must continue maintaining forces capable of deterring against a nuclear attack by the Russian Federation or a rogue state. Second, it was agreed that the United States remains very interested in pursuing deep reductions in strategic forces. Finally, the Administration fully supports deployment of effective theater missile defenses and the option to deploy a national missile defense against limited attacks, but does not endorse development or deployment of a strategic defense against the Russian Federation. It is important to point out, the panelist noted, that the Administration is committed to making any ballistic missile defense system compliant with the ABM Treaty. Abandonment of the treaty, explained the panelist, would severely jeopardize work on the START I, II, and III

agreements, a consequence that would clearly not be in America's interest.

It was the opinion of this member of the panel that by outlining four key components of a potential START III agreement, the Helsinki joint statements may prove crucial to future agreements on strategic arms reductions. These elements, while by no means final, will serve as a framework on which to base future START III talks.

A START III agreement must first reduce levels of deployed warheads from START II levels, which are at 3,000 and 3,500, to the 2,000 to 2,500 range by 2007. This is not an arbitrary number; rather, it is the level at which the U.S. government decided it could achieve meaningful arms reduction and still meet its current deterrent requirements. A second requirement of a potential START III agreement is that it must include provisions for destruction of strategic nuclear warheads, as well as transparency measures. The language on this matter that was included in the Helsinki statements was meant to be purposely vague; for example, discussions regarding START III should not be limited to just destruction or transparency, for there could be other ways to ensure irreversibility and to prevent a rapid uploading.

Third, the presidents agreed in Helsinki that steps should be taken to ensure that the treaties are of unlimited duration. This component was inserted to hedge against a potential rollback to higher levels. Finally, systems under START II must be deactivated by December 31, 2007. While 2003 was the original date for termination of START II, Helsinki agreed to extend that date to account for delays in ratification.

Proposals for Altering Russian Thinking on Strategic Nuclear Weapons

Throughout the conference, attendees from Russia and elsewhere articulated the fact that the possibility of a START III agreement remains uncertain because of lingering concerns over START II within the Russian Duma. By ratifying START II, critics contend, Russia runs the risk of relinquishing a substantial amount of strategic ground to the Americans. Considering NATO expansion, the Chechnya debacle, military downsizing, and the staggering state of the Russian economy, another loss, either real or perceived, would be devastating to the collective Russian psyche. Consequently, ratification of START II has been upheld in the Duma for quite some time. One Russian conference attendee predicted that the Duma will not consider the treaty until at least 1998.

In light of this somewhat dismal picture for START II, some Russian scientists, such as a member of this panel, have offered alternative ways of conceptualizing the Russian strategic nuclear weapons arsenal under a START II framework, which, among other things, restricts the United States and Russia each from fielding no more than 3,500 strategic nuclear warheads, 1,600 strategic delivery systems, and 1,750 submarine-launched ballistic missile (SLBM) warheads. While aware of his countrymen's criticism of START II, this panelist contended that were the Russian strategic nuclear weapons arsenal restructured in a balanced fashion, Russia would incur enormous economic benefits without relinquishing much of its strategic position relative to the United States.

One proposal would eliminate obsolete strategic weapon systems, weapon systems deployed beyond the Russian territory, and weapon systems whose principal elements were manufactured outside the Russian territory. In this case, the Russian nuclear arsenal would include SS-19 intercontinental ballistic missiles (ICBMs) with 1,020 warheads; SS-25 ICBMs with 234 warheads; SS-N-20 SLBMs with 1,200 warheads; SS-N-23 SLBMs with 448 war-

heads; and 83 heavy bombers carrying 193 warheads. Under this option, Russia's total number of warheads would be 3,095. It would possess 719 strategic delivery systems and 1,648 warheads on SLBMs. Payloads would be comprised of both multiple independently-targetable reentry vehicles (MIRVs) and single warheads. This strategic force posture would comply with START II requirements, the panelist explained, except for the placement of MIRVs on SS-19s.

Accounting for the absence of MIRVs, and taking into consideration START II limitations on arsenals of SS-19 and SS-25 ICBMs, Russia's strategic nuclear weapons arsenal would be reduced to 105 SS-19 and 324 SS-25 ICBMs. This plan would yield a total of 2,279 warheads, 744 strategic delivery systems, and 1,648 warheads on SLBMs--levels which are substantially lower than that which is required by START II, and arguably more in line with a START III framework.

According to the panelist, some Russian leaders would attack this proposal for failing to comply with the approach previously adopted by the Russian military, which considered ICBMs as the key leg of the Russian strategic weapons triad. In turn, Russian military leaders might be apprehensive about configuring a force posture compliant with START III specifications. Modification of the START III nuclear force posture is conceivable, by cutting the number of Russian strategic warheads to about 1,500 and the number of strategic delivery systems to 1,390, thus allowing the use of only single warheads on ICBMs and SLBMs, which would total 1,075 and 232, respectively, in addition to 83 heavy bombers.

To enhance safety levels under a START III agreement, the Russian panelist argued that it might be prudent to prohibit ballistic missile-carrying submarines from operating in international waters, except if the missiles were replaced by nonnuclear weapons or mock-ups. This latter provision would allow strategic submarines to participate in military exercises. Limiting strategic submarine activities, contended the panelist, would be beneficial to the entire international community because this kind of military system is among the most dangerous, largely on account of its potential for accidental or unauthorized actions.

The Chinese Perspective

The end of the Cold War created conditions that now appear conducive to nuclear disarmament, contended the member of the panel from China. This environment has created an onslaught of proposals by a number of groups and organizations which outline a path that could lead to the eventual abolition of nuclear weapons. Most of these studies, including those sponsored by the Henry L. Stimson Center and The Atlantic Council, recognize the fact that the complete prohibition and destruction of nuclear weapons are a long-term task fraught with numerous obstacles.

The panelist pointed out that serious progress in nuclear force reductions will not take place until new verification technologies and techniques are developed, coupled with the establishment of a quality verification regime capable of supporting collaborative efforts. According to this panelist, effective safeguards and verification measures will generate enough confidence among nuclear-weapons states to allow for serious reductions in nuclear arsenals to occur.

The panelist outlined four requirements for verifying steps in nuclear arms reductions: First and foremost, monitoring of arms control agreements such as START I must be feasible. START I does not require the United States and Russia to destroy retired warheads; however, it is im-

plied that a number of weapons will be dismantled, with fissile material kept in storage pits. The verification regime inaugurated by START I was, in fact, the first of its kind, in terms of complexity and intrusiveness. In addition to verification by national technical means, data notifications, missile flight test telemetry exchanges, and other cooperative measures, START I currently provides for twelve forms of on-site inspections and exhibitions, as well as continuous on-site monitoring activities at specified facilities.

Another requirement of effective verification is that it must ensure the irreversibility of nuclear weapons reductions. New technologies and attitudes will be needed in the future to ensure that warhead dismantlement and the disposition of fissile materials continue; while the United States and Russia have made progress on warhead dismantlement and plutonium disposition, verification technologies ensuring irreversibility are less developed.

The third requirement is the need for control of the fissile material in the civil fuel cycle. Plutonium is separated from reactors at a rate of about twenty tons per year. What is troublesome, the Chinese panelist said, is that the world stockpile of civil plutonium is projected to increase to about 200 tons by the year 2000. Even though the plutonium would be "innocent," he argued, rogue states using even just moderately sophisticated nuclear weapon designs would produce weapons with assured yields substantially higher than the kiloton range. While safeguard systems for the Nuclear Non-Proliferation Treaty employed by the International Atomic Energy Agency are useful, precise accounting systems are necessary to track plutonium output from civil reactors.

Finally, verification will be required especially in a nuclear weapons-free world. In a world of fewer or no nuclear weapons, monitoring measures and verification regimes must possess high reliability as well as high accuracy in order to prevent any breakout of weapon-usable materials.

The panelist from China felt confident that the world will take a more cooperative approach to the development of verification technologies to conquer these challenges. Because nuclear weapons proliferation is a multinational problem and nuclear weapons abolition a global ambition, development of an international verification system--one which is equitable to all parties involved--should be the ultimate goal of arms control scientists, technicians, and policy makers.

Summary

The panelists agreed that with the end of the Cold War, the world is faced with an unprecedented opportunity to make large-scale cuts in nuclear arsenals, and in so doing, significantly reduce potential dangers to global security. Unfortunately, the process is not an easy one, and is fraught with many obstacles.

This panel examined ways in which challenges to the nuclear weapons elimination process can be overcome. One panelist suggested that some answers may ultimately arise out of the joint statements recently signed by Presidents Yeltsin and Clinton in Helsinki. These agreements, he said, laid important groundwork for the potential inking of a START III Treaty, particularly because of their emphasis on transparency. The panelist from China concurred that exchanges of important information are necessary if a multinational verification regime were created. Because nuclear weapons proliferation is an international problem, cooperation, particularly in the development of a quality verification regime, is absolutely essential.

While conditions for nuclear weapons elimination are admittedly favorable,

the panelists agreed that were START II to die in the Russian Duma, arms control as a whole would incur a serious blow. The panelist from Russia expressed his belief, however, that Russian critics of START II can conceivably be persuaded. While it may take some coaxing, this panelist argued that, in part, the solution entails asking the Russian military to reconfigure its START III force posture while no longer relying on ICBMs as the base leg of the strategic triad. According to the panelist, the proposal would not seriously weaken Russia's strategic position and would significantly aid the Russian economic situation.

PANEL SESSION 6:
THE ELIMINATION OF CHEMICAL AND BIOLOGICAL WEAPONS: IMPLICATIONS FOR THE MILITARY

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Introduction

The military has a multifaceted role in efforts to eliminate chemical and biological weapons (CW/BW). These weapons are likely to garner greater international significance in the future, in part because of their availability to rogue states and subnational groups and their potential for wreaking enormous havoc on population centers and injuring or at least encumbering troops.

Arms control efforts are more likely to mitigate the threat from chemical weapons than from biological weapons, mainly because of the difficulty associated with the detection of unlawful development, production, and storage of BW, and because of the dual-use nature of BW organisms and equipment. Chemical, as well as biological, arms control is not cheap, however. Thus, in the future, many states will question whether to invest a substantial portion of their decreasing defense budgets in order to fund expensive chemical and biological arms control measures which have no guarantee of success.

While the costs associated with chemical and biological arms control are high, so are the stakes. One only has to imagine the devastating consequences of a CW or BW attack. Measures like strengthening the Biological Weapons Convention (BWC) and requiring states to destroy their chemical weapon stockpiles are minimal, but significant, in that they might prevent or at least lessen the threat of use of chemical or biological weapons against U.S. forces, allied troops, or a population center.

The Costs and Benefits of Chemical/ Biological Arms Control

Chemical and biological arms control both present a mix of costs and benefits to the warfighter and decision-maker. While the cost-benefit balance for chemical arms control is clearly on the benefit side, the opposite holds true for biological arms control.

For chemical arms control, chief among the benefits is the ongoing destruction of chemical weapon stockpiles. Through the Cooperative Threat Reduction

(CTR) program, the United States assists Russia in complying with the Chemical Weapons Convention (CWC) by providing assistance for the safe elimination of Russian chemical weapons. This effort serves as an example to other CWC signatories while enhancing transparency measures between nations. Other benefits for chemical arms control include the creation of a legal prohibition, both in international and domestic law; increased probability of detection of illicit CW programs; and export controls which make CW acquisition by proliferant states and terrorists more difficult.

The panel generally agreed that an additional biological arms control regime would be less beneficial to international security than the CW protocol, for three primary reasons. First, an international legal prohibition on BW already exists. Furthermore, it is unlikely that an inspection regime would lead to an increased probability of detection of BW programs. Finally, the dual-use nature of BW equipment and materials makes it improbable that export controls would be very effective at halting proliferation.

The panelists contended that the major disincentive of chemical arms control is that participating nations bear extensive financial burdens. There is no obvious, clear dividend to the warfighter, as money spent on implementing arms control measures is not available for chemical defenses or for other military purposes. Instead, Department of Defense (DoD) arms control funds are applied mainly to chemical demilitarization and CTR and On-Site Inspection Agency (OSIA) operating funds. Other CWC-related costs will be borne by the Department of State and other civilian agencies and not deducted from the DoD support to the warfighter.

Arms control also raises the potential that a false sense of security may lead DoD and the Congress to view CW/BW as less of a threat and reduce CW/BW defense funds accordingly. Finally, the effort involved in preparing for inspections is costly in both dollars and manpower.

Critics of strict BW arms control measures contend that application of verification measures incurs the costs noted above, while creating the risk of exposing U.S. vulnerabilities in medical and protection capabilities.

The Threat

Chemical and biological weapons are attractive to many nations mainly because they perceive them as a way of countering apparent imbalances between their own and potential adversaries' conventional capabilities. Compared to nuclear weapons, chemical weapons are relatively cheap to acquire or produce, and the materials to do so are readily obtainable. Biological agents can be more deadly than chemical, making large stockpiles unnecessary.

Currently, more than twenty countries are working toward obtaining a CW capability, and more than ten are attempting to develop a BW capability. Some twenty countries should have the capability to deliver CW or BW by the year 2000.

According to panel members, there are numerous reasons why a hostile state would use CW/BW. As noted, these weapons could serve as a force multiplier to counteract an adversary's conventional superiority and counteract asymmetrical forces. Second, they can be employed to deter power projection by threatening massive deploying forces casualties. One estimate showed that had Iraq delivered an anthrax attack via Scud missiles just prior to the allied ground offensive, the allied forces

could have suffered some 76,000 casualties. Third, chemical and biological weapons could also be employed as a direct threat. Fourth, chemical and biological weapons may be able to break up or prevent the formation of a coalition by targeting or threatening allies. Strategists have postulated that a successful Iraqi CW attack on Israel would have drawn a massive response from Israel, thus very likely causing the coalition to be dissolved. Additionally, many allies may be "one-bomb states," in that they have one lucrative countervalue target, destruction of which or the threatened destruction of which would result in that country collapsing. Finally, chemical and biological weapons might be an attractive option for certain countries because of their "end-game" use in maintaining a regime that was threatened with occupation or overthrow.

The CW/BW risk is very likely to grow, particularly as a threat from non-state actors. To date, there have been fifteen cases of terrorists known to possess CW/BW. There have been about ten cases of military CW use in the 20th century--the largest being campaigns during World War I. World War II is interesting in that CW was not used, primarily because of the threat of deterrence in kind and because the political leaders had personally experienced CW use in World War I. For example, Hitler was gassed, Churchill served in the trenches, and, as an artillery officer, Truman delivered gas attacks.

The panel did not explicitly mention the role of CW defenses in preventing attack, but noted that to date, no nation that possessed effective defenses against chemical weapons has been subjected to CW attack.

The current CW/BW threat situation is complicated by a number of disparate factors. First, the United States lacks BW detection capabilities, particularly in the area of remote real time detection. Second, because of the likelihood that the United States will participate in coalition efforts, there is a greater need to protect allies as well as U.S. troops. Allied civilians who directly support U.S. forces, such as dock workers offloading ships and air base support personnel, also need protection. Finally, adding to the CW threat is the lack of a large-scale decontamination capability, including the inability to decontaminate the civilian air fleet used for deployment.

The CW Response

The response to the CW threat is two-tiered. Arms control, including the CWC and the CTR program, reduces chemical stockpiles and makes the detection of illicit CW programs more likely. The CWC, specifically,

- requires states parties to destroy their CW stockpiles, something the United States is doing unilaterally,
- makes possession of CW illegal under international law,
- improves the prospects for detecting CW production and acquisition,
- constrains rogue states from acquiring CW through export controls,
- bolsters efforts to fight terrorism, and
- prohibits new or novel agents.

The CTR program uses DoD funds to assist the states of the former Soviet Union in the elimination of weapons of mass destruction and delivery systems. The primary focus of the CTR program is the elimination of nuclear weapons, but Russian chemical weapons destruction is a major separate program contained within CTR.

Russia inherited all of the Soviet Union's CW stockpile, declared to be some

40,000 metric tons of chemical agent, including 32,500 metric tons of nerve agent. It is located in seven storage facilities, all within the Russian Federation. Currently, U.S. support to Russian chemical weapons destruction has two foci: establishing a Russian analytical monitoring capability and initiating nerve agent destruction at the Shchuch'ye storage site.

The analytical capability provided by the United States is programmed to be in place in 1998; it consists of three mobile laboratories plus renovation and equipping of a central analytical lab. The United States is also assisting in building a pilot destruction facility at Shchuch'ye. This facility will use a two-step destruction process--neutralization followed by bituminization. To date, the United States has provided planning support and participated in a joint evaluation to determine the efficacy of the process. Plans call for the United States to conduct site surveys at Shchuch'ye in preparation for construction of the pilot plant and, pending congressional authorization, assist in the pilot plant construction.

This arms elimination effort is designed as a complement to a robust and coordinated chemical/biological defensive program to protect U.S. forces. The U.S. chem/bio defensive program has been funded at a fairly constant level, about $500 million per year, and has widespread support in Congress. One panelist implied, but did not explicitly state, that this funding was inadequate--being only about two percent of the defense budget. A defense serves as a hedge against breakout of the treaties by an adversary and also protects against attack by states that are not parties to these treaties.

The challenges facing this defensive program are largely related to force projection and improving operating capabilities while in Mission-Oriented Protective Posture gear. Chemical and biological defensive equipment must be lighter and impose less of a physiological burden on protected troops. Unlike the Cold War mission of fighting a war in Europe, future conflicts will not permit the luxury of prepositioning equipment overseas. Commanders should not be faced with making a tradeoff between deploying with chem/bio defensive equipment or other mission-essential equipment.

As stated above, the United States is actively engaged in eliminating its CW stockpile; the BW program was terminated in 1975. The cost for destroying the stockpile is currently estimated at $12 billion--the equivalent of four aircraft carriers or 400 fighter planes. The CWC requires that this destruction be completed by the year 2007, but the current plan forecasts completion by 2004. The U.S. national policy supports this unilateral destruction effort, citing the overwhelming U.S. conventional firepower as obviating the need for a CW retaliatory option.

The BW Response

The principal BW arms control measure is the Biological Weapons Convention, which is a ban on acquisition, possession, and use of biological weapons. Although numerous voluntary confidence-building and transparency measures have been developed by the various review conferences, the BWC continues to be faulted for lacking concrete verification provisions. In addition to the BWC, the United States, the United Kingdom, and Russia have developed a trilateral statement which has been used as a basis for a series of exchange visits to biological facilities.

Efforts are underway to make the voluntary confidence-building measures mandatory and to expand their scope. There are, however, numerous difficulties facing the negotiators. First, virtually all materials

and technology needed to produce BW are dual-use, widely applicable to the agricultural, food processing, brewing and distilling, and medical industries. Second is the lack of clear delineation between general medical research, BW defense research, and activities which could produce BW. Third, BW identification technology is in its infancy, and its effectiveness in supporting verification activities is limited. Fourth, BW agents are naturally occurring; thus, identification of an organism proves nothing and raises rather than resolves ambiguities. The final difficulty for negotiators is the fact that advances in biotechnology provide new and novel agents or methods of producing traditional agents--making detection and identification nearly impossible.

One transparency measure being considered is the reporting of unusual outbreaks of disease. While openness would reduce suspicion, in reality there is often no definitive means of distinguishing between a BW accident and a naturally occurring epidemic. The recent hantavirus outbreak in the southwestern United States is a good example of a natural outbreak of a disease that was not thought to be endemic to the United States and with symptoms that had never before been associated with hantavirus. A panelist argued that had such an outbreak occurred in certain other nations, it is likely that the United States would have suspected a BW accident. Other recent incidents include a cryptosporidium outbreak in the midwestern United States, a plague epidemic in India, an anthrax outbreak in Ukraine, and Venezuelan equine encephalitis in South America.

The limited effectiveness of past BW arms control attempts does not bode well for success in a prospective BW arms control regime. Despite one of the most intrusive inspection programs in history--a regime that will be impossible to duplicate on a multinational voluntary basis--the United Nations Special Commission has failed to define the scope and scale of the Iraqi BW program. Most of the information we have about Iraq's effort is not from the inspections but, rather, from defectors. Iraq was able, in only five years, to produce an effective offensive BW capability that was virtually undetectable.

Like the response to the chemical threat, DoD also has an active biological defense program, divided into active and passive defense. Active defense is aimed at BW delivery vehicles, as well as combat methods to destroy BW production capability, and is primarily the province of the Ballistic Missile Defense Organization and the Defense Special Weapons Agency, respectively.

The passive defense program consists of medical procedures and equipment and protective equipment. The Army is the executive agent for the passive defense program, with the other Services, Department of Energy, Defense Advanced Research Projects Agency, industry, and academia participating and contributing. There is concern that openness and transparency measures added to the BWC will have two negative effects for the Biological Defense Program: First, transparency may expose U.S. vulnerabilities in detection and protection technologies; and second, transparency may cause commercial participants in the program to opt out for fear that proprietary biotechnology information will be compromised.

The Impact of Inspections

Finally, inspections themselves could have a direct impact on the warfighter. Chemical weapons storage, destruction, and former production facilities are subject to intrusive systematic inspection, to include a continuous inspector presence at destruction sites. With regard to

the United States, however, inspections are at a limited number of Army facilities and will not impact upon most DoD operations.

Challenge inspections, while unlikely to occur, pose a special problem because any facility or installation can be the subject of a challenge. The disruption of operations and the potential for compromising sensitive information make each challenge inspection costly if one were to occur. The panel pointed out the efforts of the services and OSIA in preparing for this possibility. Planning for arms control inspections must become a routine part of nuclear, biological, and chemical training.

Summary

Cheap, easy to obtain, and capable of creating a mass casualty situation in population centers, chemical and biological weapons are likely to pose a major threat to international security in the 21st century. Currently, more than twenty countries are working toward obtaining a CW capability, and more than ten are working toward a BW capability. Some twenty countries will likely have the capability to deliver CW or BW by the year 2000.

The consensus of the panelists, however, was that if adequate steps are taken, the CW/BW threat can be significantly reduced. Particularly in the BW case, though, arms control alone will not be adequate: The potential threats are such that a verification regime would be costly in terms of financial and human resources, with doubtful effectiveness. Arms control, the panelists concluded, should be combined with a robust defensive program, thus reducing the threat of U.S. and allied forces having to face a CW/BW-armed opponent and enabling them to fight and win two major regional conflicts even if chemical or biological use did occur.

ROUNDTABLE DISCUSSION: THE FUTURE OF ARMS CONTROL: DEFENSE BY OTHER MEANS?

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Introduction

During his tenure as Secretary of Defense, William Perry often referred to efforts for reducing armaments and preventing conflict as "defense by other means." This implies that the arms control activities discussed throughout the conference do indeed have an impact on U.S. national security comparable to, or at least complementary with, the traditional resources at the disposal of the military establishment.

The opening plenary session, which was chaired by the commander-in-chief of the U.S. Strategic Command, examined arms control's cost or benefit to the military commander in carrying out the combat mission. Subsequent sessions dealt with technologies and techniques available to the arms control planner and implementor. It made sense, therefore, to examine during the final session whether arms control represents a form of defense by other means; in other words, how and under what conditions does arms control in all of its various manifestations contribute to a nation's political-military security? More importantly, how will this relationship play in the future, given the scenarios, capabilities, and constraints examined both in Norfolk the past week and throughout our professional experiences?

Major General Gary Curtin, Director of the Defense Special Weapons Agency, noted during his opening remarks that there were a number of arms control highlights since the last conference in early June 1996. The Helsinki Accords, for example, set the stage for deep reductions in nuclear weapons and warheads. Using assistance from the Cooperative Threat Reduction (CTR) program, Ukraine completed the task of becoming a non-nuclear-weapons state in June 1996; Belarus followed suit a few months later. The United States ratified the Chemical Weapons Convention (CWC) in April, just prior to the treaty's entry into force. And, in September 1996, the United States and Russia joined the other three declared nuclear powers in signing the Comprehensive Test Ban Treaty (CTBT).

The foundations have clearly been laid for more aggressive arms control measures in the future. Emerging international political uncertainties, burgeoning nationalist movements, and tightening domestic resources have all fostered questions concerning the direction that arms control will

take--and should take--in the 21st century. Will China, for example, assert its potential as a regional hegemon? If so, what is the future of the CTBT and the Nuclear Non-Proliferation Treaty (NPT)? What does this mean for undeclared nuclear-weapons states like India and Pakistan? Will NATO enlargement supplant arms control in Europe or, alternately, raise the requirement for further confidence-building measures and treaties?

In light of these uncertainties, many international security experts question the necessity of vast budgetary expenditures on arms control efforts whose effectiveness, now and in the future, is unclear. Arms control measures are different from many defense programs in that their funding does not lead to a tangible product such as a weapon system or aircraft carrier, which also spawn benefits to local economies. This has led some politicians and leaders to argue that with so many nations tightening their financial belts, arms control and threat reduction programs ought to be de-emphasized in the future.

These and other questions need to be addressed: What does the future hold for arms control, especially considering the foregoing conditions and uncertainties which characterize the current state of international and national affairs? Is there a continuing role for arms control, although at times its benefits for a nation's security may be unclear, in the emerging international environment? Will arms control retain a vital role into the next century in helping to ensure the success of national, regional, and international security goals and interests?

Current and Future Arms Control Expenditures

It is difficult to criticize the wisdom of U.S. arms control expenditures during the past ten years. To date, the panelists agreed, national security investments have been well-placed, resulting in balanced arms control of offensive and defensive weapons. This is important, one panelist contended, because the belief that a nation's security can rest solely on the existence of arms control agreements is mistaken. While the United States and its allies should continue to reduce their weapons arsenals, a prudent offensive capability must be maintained to serve as a hedge against future conflicts. The panelist noted that were the Russian Duma to ratify a second Strategic Arms Reduction Treaty (START II), a sufficient offensive nuclear capability would still exist.

Another panelist added that arms control does have an important role to play in international relations, but leaders must become aware that agreements should not be static. They should be altered over time to reflect more accurately realities in the changing state of international affairs. This panelist argued that the 1972 Anti-Ballistic Missile (ABM) Treaty best exemplifies this point. This treaty, said the panelist, "reflects the views of an era gone by" and hinders U.S. national security interests because of the confrontational presumptions which underlie the treaty and thus, must be eliminated. The international arena is characterized by disorder--rogue states and sub-national groups whose ambitions to wreak havoc must be stifled. Thus, it is imprudent for U.S. leaders to appease Russian interests and limit tools at their own disposal.

As far as future expenditures are concerned, there was consensus among the panelists that the future of arms control is still largely unclear. One cannot predict where problems will arise and, consequently, what measures should be taken. A panelist noted that measures aimed at enhancing transparency and increasing intrusiveness might be misguided. While the verdict is still out, these could be economically as well as politically expensive measures, devoid of much benefit.

A New Marshall Plan/Cooperative Threat Reduction

During the most recent debate in Congress over the FY1998 defense budget, some legislators criticized the CTR program as being a waste of U.S taxpayer dollars. They echo the views of constituencies who question the value of pouring money into the budget of a Cold War enemy which still has enough resources to modernize its strategic systems. Other U.S. leaders and national security experts argued that with the Marshall Plan's fiftieth anniversary celebrations occurring at the same time as this conference, some consideration ought to be given to the potential for new, similar plans to help the states of the former Soviet Union (FSU) build more solid foundations for capitalism and democracy.

While admitting that the CTR program is not devoid of flaws, the panelists disagreed with any plan for CTR's elimination. They argued that the program remains a good investment and offers a number of benefits to U.S national security, one being the employment of Russian scientists. Considering the vast, mainly financial, temptations lingering outside Russia's borders, it is extremely important, from a proliferation standpoint, to retrain and productively employ Russian scientists. The International Science and Technology Center (ISTC)--the CTR-sponsored program to employ thousands of former Soviet scientists in civilian endeavors--is viewed not only as a plus for international security but also as the salvation for science in the post-Soviet capitalist system.

Another panelist agreed with the premise that the ISTC might be a starting point for focusing future efforts. Despite the overall meager results of CTR's defense conversion attempts, the ISTC and lab-to-lab programs mostly have been successful in bringing groups together. Consequently, both could serve as models on which to build and try new ideas. As a result of the progress of the ISTC and lab-to-lab talks, Japan and the European Union are now investing much more heavily in these areas.

In terms of the future direction of CTR, a few panelists contended that it would be prudent to increase the role of private industry in the program. CTR could be improved, said one panelist, by using program funds as seed money to spark private investment. This would make CTR easier to sell to the public and Congress in the future, especially in light of conjectures that Russia will continue using its own internal resources on weapons modernization. One panelist suggested that such investment could also lead to the transformation of weapons infrastructures within the FSU. Without enhanced transparency measures and greater cooperation from other governments, added one panelist, it would be far more difficult to get private industry involved in projects associated with elimination of chemical and biological weapons.

Russian Ratification of START II

At the moment, the Russian Duma is gridlocked on START II ratification, and there is no definitive timetable for its consideration. The Duma will eventually get back to debating the treaty, although issues associated with NATO expansion, the CWC, and adaptation of the Conventional Forces in Europe Treaty are likely to come first. Members of the panel predicted that START II ratification will not be raised again until 1998.

The panelists concurred that should Russia not ratify the START II agreement, future assistance to Russia will be an extremely contentious issue, especially in the U.S. Congress. The idea of pursuing arms control through unilateral presidential declarations of reductions was met with disdain by one panelist, who argued that because of its financial troubles, Russia will come

down to START II levels anyway. Because of this, the idea of a START III agreement is by no means out of the question. It will, however, require some diplomatic skill, and progress on arms control will develop, once tension over the issue of NATO expansion clears.

Issues Affecting the Russian Military

Russia's current goal of downsizing its military is problematic, especially when considering that the official once in charge of executing that plan, former Defense Minister Igor Rodionov, has been ousted, and that Russia has no good model on which to base its downsizing effort. Cutting the size of the military will require an enormous amount of political will in Russia, said one panelist, something which has been clearly absent from the Russian leadership ranks for quite some time. In fact, Rodionov was dismissed because he failed to meet any of the deadlines for downsizing. While in office, Rodionov claimed that the problem with Russian downsizing is that state law requires the government to provide demobilized officers a house and eighty percent of their salary. Cognizant of Russia's strapped financial condition, Rodionov contended that downsizing was simply too expensive to carry out.

The problems associated with Russian military downsizing present a Catch-22 for Russian leaders because of the enormous size of the Russian military, including the numerous and cumbersome central controls and service academies, none of which has been reduced to date. At the heart of the Russian military's problem is vertical integration--there are two civilians employed for every enlisted man. One panelist familiar with recent trends in the U.S. Department of Defense noted that Russia's military will continue to be over budget because of its total unfamiliarity with outsourcing.

Another consideration for Russian military downsizing, added one panelist, is that a feeling of stability must persist during the compulsory downsizing, not only for psychological reasons, but also to ensure that control over fissile materials is maintained.

The Future of the Comprehensive Test Ban Treaty

One panelist argued that while the CWC took up much of Congress's time during recent sessions, the CTBT is likely to emerge as the next arms control treaty on the docket. The wrangling over the CWC suggests that the CTBT will have a tough time obtaining Senate advice and consent. Uncertainty over the usefulness of the agreement and the safety of the U.S. stockpile will add to the difficulties associated with its passage. Another panelist added that the lack of movement on START II will only exacerbate the situation. This reverts back to the perception among some U.S. legislators that Russia is using American aid to free up precious resources for a modernization program which could be used to threaten the United States and its allies in the future.

Prospects for Arms Control in China

The current U.S. strategy of engaging China is likely to continue in the future, as are difficulties in the U.S.-China relationship. It is becoming apparent that economics will likely continue to be used as both a carrot and stick in order to work out mutually favorable deals. Ongoing discussions in the United States over whether to grant China most-favored nation status illustrates this point. One panelist noted that in order to develop more industrial relationships, greater transparency between the two nations is necessary. Arms control agreements are thus very important to the direction of U.S.-China relations.

As it engages China, the United States must strongly consider its plans for Theater Missile Defense (TMD), which could give the Chinese wrong signals and discourage fruitful dialogue. So far, Chinese leaders have given strong indication that they are willing to speak the same language as the United States on nuclear material issues; communication is taking place, and understanding appears to have been established. The panelists agreed that if progress between the United States, Russia, and China on arms control is to continue, constructive dialogue must be maintained, particularly when the goals of all three nations come into conflict. This sentiment was echoed earlier in the conference by panelists from the People's Republic of China.

Pursuing Missile Defense Technologies

It is absolutely essential, two panelists vehemently argued, for the United States to have strong, effective systems to counter missiles from so-called rogue states. For this to be accomplished, however, a number of complicated issues have to be worked out. First is President Yeltsin's agreement at the Helsinki Summit to accept a new understanding of the ABM Treaty allowing the United States to pursue missile defense efforts; for this, Yeltsin has been harshly criticized back home.

Second, the Pentagon's recently released Quadrennial Defense Review (QDR) report acknowledged that America's plan for a National Missile Defense, known as "three plus three" because it would take three years to develop and three years to deploy, will continue to be a high-risk program. Deployment of an initial defensive capability within six years cannot be accomplished at a low cost, the QDR noted.

Third, the United States needs to address the terms of Article V of the ABM Treaty in order to fully develop its missile defense program, a point that was made earlier in the week by two officials from the Pentagon's Ballistic Missile Defense Organization. Article V stipulates that parties to the agreement must not develop, test, or deploy any sea, air, space, or mobile land-based ABM systems or components. The article also states that parties must not develop, test, or deploy ABM launchers capable of launching more than one ABM interceptor missile at a time from each; nor are parties allowed to modify deployed launchers that will provide them with such a capability. Current TMD efforts are using "dumbed down" capabilities so as to remain compliant with Article V. One panelist argued that if these systems are not improved to their fullest potential, the threat of blackmail may become extremely serious. It is counterproductive for the United States to limit itself only to current capabilities and outdated agreements. The panelist added that the United States must move away from the mindset of defining security as mutual vulnerability. Furthermore, defenses have a moral advantage over offensive weapons because they threaten no one but the aggressor while serving as a deeply effective countermeasure to proliferation.

There was consensus among the panelists that the United States must develop fully all relevant technologies, whether they be geared toward National or Theater Missile Defense. The uncertain climate of the international environment means that the United States needs a defensive capability not only against ballistic and cruise missiles, but also deadly devices capable of being detonated in Ryder trucks. The United States also needs tools capable of providing its warfighters accurate intelligence, such as a low-altitude satellite capable of detecting from where missiles are being launched. In general, summarized one panelist, only through a number of systems which form an extensive and elaborate multiple capability can the United States adequately respond to all potential threats.

Regional Concerns

The nature of the international context has changed so dramatically in the past decade that multidimensional national security concerns are a new focus of U.S. leaders. There is no simple bilateral or multilateral resolution to outstanding issues, which are often a curious mix of economic, environmental, and security concerns.

In this vein, while the transformation from the Soviet Union to the FSU has contributed to this new focus, markets there are continuing to develop, and real stability has been preserved in that region. More so than ever, future alliances and U.S. relationships are having a major impact on the region, as exemplified by NATO enlargement.

The panelists agreed that NATO should not fundamentally change its mission as a result of the ongoing changes in international relations. The U.S.-NATO relationship continues to enhance stability throughout Europe and the rest of the world and has been more effective than the NPT in extending nonproliferation. NATO expansion should be able to assist further with nonproliferation in the Eurasian countries established following the Soviet Union's demise.

It is unrealistic, the panelists noted, to believe that the United States will establish other alliances like NATO, since it will probably be unwilling to make similar commitments in other areas. Thus, the United States needs to encourage smaller groups to open dialogues as well as maintain the alliances that already exist.

Arms Control Issues as the 21st Century Approaches

The issue of de-alerting is likely to become a major topic in future arms control discussions with the Russians. The panelists agreed that before the United States can pursue a strategy of de-alerting, procedures for verification would have to be installed. Were this to be achieved, effective missile defenses would still be necessary, largely because Russian paranoia would probably increase. With this in mind, one panelist contended that a multilateral agreement on de-alerting would probably be necessary. Attention to the placement of the de-alerted warheads would also be necessary, since proliferants might be encouraged to attack if the warheads were placed in a small number of storage sites.

The Conventional Forces in Europe Treaty is likely to continue being a major item in U.S.-Russia negotiations. There are three issues under consideration with regard to the treaty: (1) doing away with the bloc-to-bloc structure of the treaty; (2) underpinning the structure for enlarging NATO; and (3) ensuring that the basic structure of the treaty remains. Said one panelist, eliminating the bloc-to-bloc structure of the treaty will enable NATO enlargement to move forward in a smoother and more timely fashion.

In the future, offense-defense arms control tradeoffs might not be the best approach. Instead, as one panelist noted, the United States ought to develop a comprehensive strategy stressing three specific areas: strong defenses, arms control, and military requirements and capabilities. The panelist contended that the right pieces and emphases are already in place, but communication between the elements must be improved. In order for such a new nuclear weapons strategy to come to fruition, there must be stronger leadership and bureaucratic commitment.

Summary

The future direction of arms control is still uncertain. Many factors have to play out--political developments in Russia and China foremost among them--before it can

be determined where commitments should be focused and how expenditures should be made. Because of tightening defense budgets in the United States and elsewhere, most arms control measures in the future will be met with caution and, thus, undergo extreme scrutiny by legislative bodies unconvinced about the impact of arms control activities on U.S. national security. For example, the U.S. House of Representatives engaged in substantial debate just this year concerning the budget of the CTR program.

Full funding for CTR was preserved, nonetheless, due to vocal supporters of the program, who echoed former Secretary of Defense William Perry's sentiment that CTR, like other arms control efforts, is essentially "defense by other means." Consequently, it is comparable, or at least complementary with, other traditional resources at the disposal of the diplomatic and military establishments.

Some panelists pointed out that certain issues could potentially weaken the utility of arms control efforts--agreements allowing for overly intrusive inspections being the most noteworthy example. The premise that arms control offers a great advantage to the warfighter was not struck down by any panelist, however. In fact, all agreed that in light of the uncertainty which characterizes the post-Cold War international security environment, arms control is an indispensable tool in the warfighter's arsenal and will remain a vital instrument of national security and international stability.

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ABBREVIATIONS AND ACRONYMS

ABM	Anti-Ballistic Missile
ACDA	Arms Control and Disarmament Agency
ATSD(NCB)	Assistant to the Secretary of Defense (Nuclear and Chemical and Biological Defense Programs)
BMD	Ballistic Missile Defense
BW	Biological Weapon
BWC	Biological Weapons Convention
CFE	Conventional Armed Forces in Europe Treaty
CD	Conference on Disarmament
CTR	Cooperative Threat Reduction
CTBT	Comprehensive Test Ban Treaty
CVR	Center for Verification Research
CW	Chemical Weapon
CWC	Chemical Weapons Convention
DoD	Department of Defense
DOE	Department of Energy
DSWA	Defense Special Weapons Agency
FSU	Former Soviet Union
FMCT	Fissile Material Cut-Off Treaty
FMEG	Fissile Material Experts Group
GC-MS	Gas Chromatography-Mass Spectrometry
IAEA	International Atomic Energy Agency
ICBM	Intercontinental Ballistic Missile
ISTC	International Science and Technology Center
JACADS	Johnston Island Facility
JACIG	Joint Arms Control Implementation Group
MIRVs	Multiple Independently-Targetable Reentry Vehicles
MoD	Ministry of Defense
MOX	Mixed Oxide Fuel
MPC&A	Material Protection, Control & Accounting
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical
NGO	Non-Governmental Organization
NMD	National Missile Defense

NPT	Nuclear Non-Proliferation Treaty
NRC	National Research Council
OSCE	Organization for Security and Cooperation in Europe
OSIA	On-Site Inspection Agency
PAC	Patriot Advanced Capability-3
QDR	Quadrennial Defense Review
RCRA	Resource Conservation Recovery Act
RDT&E	Research, Development, Testing, and Evaluation
SAIC	Science Applications International Corporation
SALT	Strategic Arms Limitation Treaty
SDI	Strategic Defense Initiative
SLBM	Submarine-Launched Ballistic Missile
START	Strategic Arms Reduction Treaty
THAAD	Theater High-Altitude Area Defense
TMD	Theater Missile Defense
WMD	Weapons of Mass Destruction